CENTRAL VALLEY REGIONAL
WATER QUALITY CONTROL BOARD

Surface Water Ambient Monitoring Program

Tulare Lake Basin Annual Report: Fiscal Years 2002/2003 and 2003/2004

June 2007

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

State of California
Arnold Schwarzenegger, Governor

California Environmental Protection Agency
Linda S. Adams, Secretary for Environmental Protection

REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

11020 Sun Center Drive #200
Rancho Cordova, CA 95670

Phone: (916) 464-3291
email: info5@waterboards.ca.gov
Web site: http://www.waterboards.ca.gov/centralvalley/

DISCLAIMER

This publication is a technical report by staff of the California Regional Water Quality Control Board, Central Valley Region. No policy or regulation is either expressed or intended.

Surface Water Ambient Monitoring Program

Tulare Lake Basin Annual Report: Fiscal Years 2002/2003 and 2003/2004

June 2007

REPORT PREPARED BY:

ANNEE FERRANTI
Environmental Scientist
Agriculture and Planning Unit

AND

STEVEN HULBERT
Environmental Scientist
Agriculture and Planning Unit

Special thanks to the United States Forest Service, Cannel Meadow Ranger District;
the United States Army Corps of Engineers;
and the Friends of the South Fork Kings River.

REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION
California Environmental Protection Agency

TABLE OF CONTENTS

List of Tables

List of Attachments

SURFACE WATER AMBIENT MONITORING PROGRAM
ANNUAL REPORT FISCAL YEARS 2002-2003 AND 2003-2004

EXECUTIVE SUMMARY

The Central Valley Region is the largest Water Board region in California and encompasses approximately 40 percent of the land area in the state. The Central Valley Region consists of three distinct Basins; the Sacramento River Basin, San Joaquin River Basin, and the Tulare Lake Basin. The Tulare Lake Basin comprises the drainage area of the San Joaquin Valley south of the San Joaquin River and consists of approximately 10.5 million acres, including the historical lakebed. Essentially, it is a closed basin since surface water drains north to the San Joaquin River only in years with well above average rainfall. Approximately 3.5 million acres of the upper Basin are federally owned and in part comprise Kings Canyon and Sequoia National Parks; and substantial portions of Sierra, Sequoia, Inyo, and Los Padres National Forests. The dominant land use in the valley floor portion of the Basin is agriculture with approximately 4.5 million acres under cultivation or irrigation.

The Tulare Lake Basin is divided into six watershed management areas (Watershed Management Initiative Chapter, 2001) including:

- the Kern County Basin Management Area which includes the Kern River, Poso Creek, and westside streams of Kern County;
- the Tulare Lake Basin Management Area which includes the historical lakebed, ephemeral and westside streams in Tulare county;
- the Tule Basin Management Area which includes the Tule River, Deer Creek, and White River drainage areas;
- the Kaweah Basin Management Area which consists of the Kaweah River, Yokohl Creek, St. Johns River, and Cross Creek;
- the Kings Basin Management Area which includes the Kings River and the drainage area for the tributaries of the Kings River; and
- the Westside and Pleasant Valley Basin Management Area which includes the drainage areas of westside streams in Kings and Fresno counties.

The State Water Resources Control Board (State Water Board) and the California Regional Water Quality Control Boards (Regional Water Boards) are responsible for protecting California’s water resources. The 2002 Strategic Plan contains the State Board’s approach to water quality protection. The State Board has developed a comprehensive monitoring program known as the Surface Water Ambient Monitoring Program (SWAMP), which operates within the framework of the State Board’s strategic plan, and has provided the funding to develop a surface water monitoring program to evaluate water quality within the six watershed management areas of the Tulare Lake Basin (Basin).

During Fiscal Years (FYs) 2002-2003 and 2003-2004, the intent of the SWAMP funded study was to establish baseline conditions and characterize water quality in the waters upstream of the four major reservoirs (Pine Flat, Lake Kaweah, Success Lake, and Lake Isabella) within the Basin, as there was little, if any, historical water quality data available for these waterbodies; and on a limited scope, the lower Kings and Kern Rivers. Chemical, and microbiological monitoring data was gathered quarterly from the South Fork Kings, the upper reaches of the Kaweah, Tule, and Kern Rivers and the associated tributaries and the above referenced reservoirs in the foothill watersheds draining the western slope of the Sierra Nevada. Water quality results from these efforts have been assessed using the water quality objectives contained in the Water Quality Control Plan for the Tulare Lake Basin, Second Edition - 1995 (Basin Plan) to determine if there is any indication that the designated existing and potential beneficial uses for each of the waterbodies are not being supported and/or attained.

Eight sampling events were conducted between September 2002 and May 2004, representing two low flow periods, two stromwater events, two irrigation seasons, and one high water (snowmelt) period.. The results indicate that selected Basin Plan water quality objectives were violated—primarily dissolved oxygen and pH; Findings indicating potential impacts to beneficial uses are sorted by waterways below.

1. South Fork Kings River, Hume Lake, Tenmile Creek, and Lewis Creek waterways--Aquatic Life beneficial uses:
   - Thirteen of the 15 Hume Lake samples which were screened for dissolved oxygen did not meet the Basin Plan minimum dissolved oxygen water quality objective;
   - Fourteen of the 28 South Fork Kings River samples which were screened for dissolved oxygen did not meet the Basin Plan minimum dissolved oxygen water quality objective;
   - Three of the 18 Hume Lake samples which were screened for pH did not fall within the Basin Plan pH water quality objective range; and
   - Two of the 34 South Fork Kings River samples which were screened for pH did not fall within the Basin Plan pH water quality objective range.

2. Lower Kings River (below Pine Flat Reservoir)-- Municipal, Agricultural, and Aquatic Life beneficial uses:
    - Nine of the 31 lower Kings River samples which were screened for electrical conductivity did not meet the Basin Plan maximum electrical conductivity water quality objective;
    - Five of the 30 lower Kings River samples which were screened for dissolved oxygen did not meet the Basin Plan minimum dissolved oxygen water quality objective;
    - Two of the 25 lower Kings River samples which were analyzed for ammonia did not meet the Basin Plan ammonia water quality objective; and
    - Six of the 31 lower Kings River samples which were screened for pH did not fall within the Basin Plan pH water quality objective range.
3. Kern River and Lake Isabella-- Aquatic Life beneficial uses:
    - Fourteen of the 108 Lake Isabella and Kern River samples which were screened for dissolved oxygen did not meet the Basin Plan minimum dissolved oxygen water quality objective; and
    - Sixty-four of the 117 Lake Isabella and Kern River samples which were screened for pH did not fall within the Basin Plan pH water quality objective range.
4. Tule River and Lake Success-- Aquatic Life beneficial uses:
    - Eight of the 30 Lake Success and Tule River samples which were screened for dissolved oxygen did not meet the Basin Plan minimum dissolved oxygen water quality objective; and
    - Eleven of the 30 Lake Success and Tule River samples which were screened for dissolved oxygen did not fall within the Basin Plan pH water quality objective range.
5. Kaweah River and Lake Kaweah-- Aquatic Life beneficial uses:
    - Five of the 26 Lake Kaweah and Kaweah River samples which were screened for dissolved oxygen did not meet the Basin Plan minimum dissolved oxygen water quality objective; and
    - Seven of the 26 Lake Kaweah and Kaweah River samples which were screened for pH did not fall within the Basin Plan pH water quality objective range.

All but three of the 56-reports of dissolved oxygen concentrations below the minimum basin plan water quality objective occurred either in the upper watershed tributaries or the lakes (20 and 36, respectively).

Bacteria samples for E. coli (a subset of fecal coliform) were analyzed during the study. Comparing E. coli results to the Tulare Basin Plan water quality objective for a single maximum fecal coliform concentration (400 MPN/100-ml), indicated three potential exceedances out of 123-samples:

DER030 Deer Creek @ R. 264 on 6/24/03	(500 MPN/100-mL)
LKI040 Lower Kings River, S. Fork W Jackson Ave.	(900 MPN/100-mL)
LKI060 Lower Kings River, N. Fork @ 22nd Ave.	(>1,600 MPN/100-ml)

Further evaluation of the E. coli results against USEPA Guidelines for various levels of contact recreation (full body at 235 MPN to infrequent contact at >574 MPN), indicated only three other occasions when contact recreation may have been limited to moderate full body contact.

TUR050 Tule River @ Globe Road on 3/24/03	(240 MPN/100-mL)
DER030 Deer Creek @ Road 264 on 6/24/03	(500 MPN/100-mL)
KER110 Lake Isabella @ Calloway Weir on 5/26/04)	(300 MPN/100-mL)

Future monitoring activities in the basin should evaluate baselines and potential sources of reduced dissolved oxygen as well as seasonally elevated pH and E. coli.

SURFACE WATER AMBIENT MONITORING PROGRAM ANNUAL REPORT FISCAL YEARS 2002-2003 AND 2003-2004

INTRODUCTION

Sections 13160 through 13193 of the Porter-Cologne Water Quality Control Act direct the State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) to develop a comprehensive surface water ambient monitoring program for the state. In order to meet this mandate, the State Water Board initially submitted a comprehensive monitoring program proposal entitled *Proposal for a Comprehensive Ambient Surface Water Quality Monitoring Program* to the California State Legislature on 30 November 2000, to integrate existing water quality monitoring activities of the State Water Board and the Regional Water Boards, and to coordinate with other monitoring programs. The Surface Water Ambient Monitoring Program (SWAMP) is a statewide monitoring effort designed to assess the conditions of surface waters throughout the state of California. The State Water Board administers the program, but the responsibility for implementation of monitoring activities resides with the nine Regional Water Boards that have jurisdiction over their specific geographical areas of the state.

The proposal serves as the blueprint for implementing efforts jointly at the State and Regional Water Boards and is intended to protect and restore the State's water resources by:

1. Creating an ambient monitoring program that addresses and evaluates water quality in all hydrologic units of the State using consistent and objective monitoring, sampling, and analytical methods; consistent data quality assurance protocols; and centralized data management;
2. Documenting ambient water quality conditions and characterizing surface water quality as either maintaining beneficial uses, or as impaired, with the scale of these assessments ranging from site-specific to watershed management area wide;
3. Determining whether there is an association between land use and water quality impacts;
4. Coordinating and collaborating with internal and external monitoring efforts to leverage limited resources; and
5. Providing data to evaluate the overall effectiveness of water quality regulatory programs in protecting beneficial uses of waters of the State.

In order to accomplish the above goals, the Central Valley Regional Water Quality Control Board developed *Surface Water Ambient Monitoring Program Work Plans* (Work Plans) for Fiscal Years (FYs) 2002-2003 and 2003-2004. The Work Plans take into account that watersheds within the Central Valley vary extensively with respect to such features as ecology, topography, geology, and overall land use. Since each watershed has both a unique set of stakeholders and unique water quality concerns that should be addressed, the management process and the accompanying monitoring programs are somewhat watershed specific. The purpose of this Report is to document the data collection activities conducted in accordance with the Work Plans for the Tulare Lake Basin.

BENEFICIAL USES

Surface water quality in the Tulare Lake Basin has been described as generally good, with excellent quality exhibited by most eastside streams. Protection and enhancement of beneficial uses of water against water quality degradation is a basic requirement of water quality planning under the Porter Cologne Water Quality Control Act.

The potential sources of contaminants and associated pollutants for the watershed management areas have not yet been identified. The monitoring program for FYs 2002-2003 and 2003-2004 was primarily designed to address potential nonpoint source impacts, since most significant water quality problems in the region result from nonpoint sources (see 1998 Clean Water Act Section 303(d) List and 1996 Water Quality Assessment). Potential sources include, but are not limited to, publicly and privately owned treatment works, individual septic tanks, confined animal facilities, livestock grazing, irrigated agriculture, urban development, and recreation. The monitoring indicators assessed in FYs 2002-2003 and 2003-2004 included field parameters such as water temperature, water quality constituents, and microorganisms. The analytical results have been evaluated for specific beneficial uses against narrative and numeric water quality objectives in the Basin Plan. In particular, the following most limiting numeric and narrative water quality objectives associated with particular beneficial uses as listed in Basin Plan were chosen:

- Drinking Water
  → electrical conductivity, arsenic, bacteria, nutrients
- Aquatic Life
  → water temperature, dissolved oxygen
- Recreation
  → bacteria
- Irrigation Water Supply
  → electrical conductivity, nutrients

MONITORING LOCATIONS

During FYs 2002-2003 and 2003-2004, monitoring locations were identified in five of the watershed management areas in the Tulare Lake Basin with similar land uses such as foothill community development, recreational uses, industrial processes, irrigated agriculture, and livestock grazing. Additional consideration in choosing sample sites included public access and safety issues. Sampling efforts on the mainstem rivers and reservoirs draining the western slope of the Sierra Nevada occurred approximately quarterly (during the irrigation, low flow, stormwater, and high water (snowmelt) seasons), to begin to establish baseline water quality conditions and to detect potential temporal and spatial variations.

The following water bodies were sampled in FYs 2002-2003 and 2003-2004:

1. South Fork Kings River and tributaries;
2. Tenmile Creek, including Hume Lake;
3. Lower Kings River;
4. Kern River and tributaries, including Lake Isabella.
5. Upper Tule River and tributaries, including Lake Success; and
6. Upper Kaweah River and tributaries, including Lake Kaweah.

Because funding for the FYs 2002-2003 and 2003-2004 was limited, the overall sampling strategy for the water bodies was based on a directed sampling approach. As there is limited qualitative data available for any of these water bodies, physical, chemical, and microbiological parameters were assessed to provide baseline information.

SAMPLE DESIGN AND COLLECTION

Sample collection, preservation, and transport were conducted in accordance with the Tulare Lake Basin Surface Water Sampling Plan (February 2002). Sample collection was conducted by Regional Water Board staff with the exception of Hume Lake, South Fork Kings River, and Tenmile Creek where volunteer monitors from the Friends of the South Fork Kings River provided sample collection assistance. Sample collection included surface water grab samples and field measurements. Grab samples were collected into laboratory supplied containers and immediately cooled to 4 degrees celsius for transfer to the laboratory. The water samples were transported to Twining Laboratories, Inc. and the University of California Davis, Limnology Laboratory where they were analyzed for nutrients, anions, cations, and specific metals; and cultured for bacterial population identification and distribution. Physical and chemical analyses were conducted in the field using hand-held meters. The electrical conductivity of samples was measured using a hand-held YSI 30 meter, dissolved oxygen and temperature were monitored using a YSI 55 meter, and pH was measured using an Oakton pH tester 2. Reservoir water clarity was visually measured using a Secchi disk. In addition, distilled water field blanks and field duplicate samples were analyzed as directed by the SWAMP Quality Assurance Management Plan (February 2002).

As stated above, the pH at each of the sampling locations was measured using a hand held pH and electrical conductivity meter with an accuracy rate of +/- 0.1 pH units and electrical conductivity units (microSiemens per cm). The hand held meters were calibrated to three known standards (pH 4.0, pH 7.0, and electrical conductivity 146.9 microSiemens per centimeter) the day prior to each sampling event.

Sample station locations are summarized in Attachment A. The sample locations were documented using a Global Positioning Satelite receiver and photographic documentation. At each sampling location, samples were collected and analyzed for:

- water temperature
- pH
- electrical conductivity
- nitrite as nitrogen
- chloride
- boron
- magnesium
- sodium
- dissolved oxygen
- clarity (reservoirs)
- total Kjeldahl nitrogen
- ammonia as nitrogen
- sulfate
- calcium
- manganese
- fecal coliform
- *E. coli*
- nitrate as nitrogen
- alkalinity
- total dissolved solids
- iron
- potassium

Sample collection dates for FYs 2002-2003 and 2003-2004 are summarized in Table 1.

TABLE 1
TULARE LAKE BASIN
QUARTERLY SAMPLING DATES
FISCAL YEARS 2002-2003 AND 2003-2004

Sample Location	*FY 02-03*	*FY 03-04*
South Fork Kings River Hume Lake Tenmile Creek	9/2002 12/2002 3/2003 4/2003	11/2003 5/2004
Lower Kings River	9/2002 12/2002 3/2003 6/2003	11/2003 1/2004 5/2004
Kern River Lake Isabella	9/2002 12/2002 3/2003 6/2003	11/2003 2/2004 5/2004
Tule River Lake Success	9/2002 12/2002 3/2003 6/2003	
Kaweah River Lake Kaweah	9/2002 12/2002 3/2003 6/2003	

RESULTS AND DISCUSSION

The Tulare Lake Basin water quality objectives for inland surface waters for the chemical parameters examined during FYs 2002-2003 and 2003-2004 are summarized in Table 2.

TABLE 2
TULARE LAKE BASIN PLAN
SURFACE WATER QUALITY OBJECTIVES

Stream	*Reach*	*Location*	*pH*	*Minimum Dissolved Oxygen (mg/L)*	*Maximum Electrical Conductivity (uS/cm)*
Kings River	Reach I	Above Kirch Flat	6.5 to 8.3	9	100
	Reach IV	Friant Kern to Peoples Weir	6.5 to 8.3	7	100
	Reach V	Peoples Weir to Island Weir	6.5 to 8.3	7	200[A]
	Reach VI	Island Weir to Stinson Weir on North Fork and Empire Weir No. 2 on South Fork	6.5 to 8.3	7	300[A]
Kern River	Reach I	Above Lake Isabella	6.5 to 8.3	8	200
	Reach II	Lake Isabella	6.5 to 8.3	8	300
	Reach III	Lake Isabella to Southern California Edison Powerhouse	6.5 to 8.3	8	300
	Reach IV	Edison Powerhouse to Bakersfield	6.5 to 8.3		300
Tule River	Reach I	Above Lake Success	6.5 to 8.3		450
	Reach II	Lake Success	6.5 to 8.3	7	450
Kaweah River	Reach I	Above Lake Kaweah	6.5 to 8.3		175
	Reach II	Lake Kaweah	6.5 to 8.3	7	175

mg/L = milligrams per liter

uS/cm = microSiemens per centimeter

[A] During the period of irrigation deliveries. Providing, further, that for 10 percent of the time (period of low flow) the following shall apply to the following reaches of the Kings River: Reach V - 400 uS/cm and Reach VI - 600 uS/cm

For the surface waters not designated above, for dissolved oxygen (DO) the Basin Plan states:

> *"The DO in surface waters…not listed for the specific water bodies must meet the following minimum levels for all aquatic life:*
>
> - *Waters designated WARM 5.0 mg/L*
> - *Waters designated COLD or SPWN 7.0 mg/L."*

The microorganism data is currently being evaluated to determine if a baseline for microbiological load can be established. The Tulare Lake Basin Plan states:

> *"In waters designated REC-1 (water contact recreation) the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed a geometric mean of 200/100 ml, nor shall more than ten percent of the total number of samples taken during any 30-day period exceed 400/100 ml."*

Because five samples for any 30-day period were not collected during the SWAMP sampling events, the resultant information should not be evaluated against the Basin Plan geometric mean bacteria water quality objective. However, the information is useful in determining which sampling sites, if any, may need more intensive sampling in the future. All of the water bodies sampled during FYs 2002-2003 and 2003-2004 are designated REC-1 (water contact recreation) as a beneficial use.

A comprehensive summary of the sample analytical results for each of the water bodies is included as Attachment B. General trends in the data are discussed below and where applicable, the results evaluated against narrative and numeric water quality objectives summarized in the Basin Plan. The analytical data for each water body are graphically represented in Attachments C, D, E, F, and G.

South Fork Kings River
Tenmile Creek-Hume Lake

During the FYs 2002-2003 and 2003-2004, 52 samples were collected during six sampling events in the upper portion of the Kings Basin Management Area (above Pine Flat Reservoir) including the South Fork Kings River, Tenmile Creek, and Hume Lake. These samples met the water quality objectives of the Basin Plan for electrical conductivity and ammonia. However, 14 of the 28 samples collected on the South Fork Kings River and 13 of the 15 samples collected on Hume Lake did not meet the water quality objective for dissolved oxygen. Additionally, three of the 18 samples collected on Hume Lake and two of the 34 samples collected on South Fork Kings River did not meet the water quality objective for pH. These exceedances of the minimum dissolved oxygen water quality objective indicate potential impacts to the Aquatic Life beneficial uses of the South Fork Kings River, Tenmile Creek, and Hume Lake.

Lower Kings River

During the FYs 2002-2003 and 2003-2004, 31 samples were collected during seven sampling events on the lower Kings River (below Pine Flat Reservoir) as it flows through the lower portion of the Kings Basin Management Area and eastern portion of the Tulare Lake Basin Watershed Management Area. Nine of the samples did not meet the Basin Plan maximum electrical conductivity water quality objective, five did not meet the Basin Plan minimum dissolved oxygen water quality objective, six did not meet the Basin Plan pH water quality objective, and two did not meet the Basin Plan ammonia water quality objective. These exceedances of the minimum dissolved oxygen water quality objective indicate potential impacts to the Aquatic Life beneficial uses. These exceedances of the electrical conductivity and nutrient water quality objectives indicate potential impacts to the Municipal and Agricultural beneficial uses of the Lower Kings River.

Kern River
Lake Isabella

During the FYs 2002-2003 and 2003-2004, 117 samples were collected during seven sampling events in the Kern County Basin Management Area including Lake Isabella and the Kern River above and below the lake. These samples met the water quality objectives of the Basin Plan for electrical conductivity and ammonia. However, 14 of the samples did not meet the water quality objective for dissolved oxygen. Additionally, 64 of the samples did not meet the water quality objective for pH. These exceedances of the minimum dissolved oxygen water quality objective indicate potential impacts to the Aquatic Life beneficial uses of the Kern River and Lake Isabella.

Tule River
Lake Success

During the FYs 2002-2003 and 2003-2004, 30 samples were collected during four sampling events in the Tule Basin Management Area including Lake Success, the Tule River above and below the lake, and Deer Creek. These samples met the water quality objectives of the Basin Plan for electrical conductivity and ammonia. However, eight of samples did not meet the water quality objective for dissolved oxygen. Additionally, 11 of the samples did not meet the water quality objective for pH. These exceedances of the minimum dissolved oxygen water quality objective indicate potential impacts to the Aquatic Life beneficial uses of the Tule River and Lake Success.

Kaweah River
Lake Kaweah

During the FYs 2002-2003 and 2003-2004, 26 samples were collected during four sampling events in the Kaweah Basin Management Area including Lake Kaweah, the Kaweah River above and below the lake, Cross Creek, and St. Johns River. These samples met the water quality objectives of the Basin Plan for electrical conductivity and ammonia. However, five of samples did not meet the water quality objective for dissolved oxygen. Additionally, seven of the samples did not meet the water quality objective for pH. These exceedances of the minimum dissolved oxygen water quality objective indicate potential impacts to the Aquatic Life beneficial uses of the Kaweah River and Lake Kaweah.

A summary of the dissolved oxygen results is presented in Table 3. Based on the summary table, all but three of the dissolved oxygen concentrations below the minimum water quality objective occurred either in the upper watershed tributaries or the lakes (20 and 36, respectively).

Recreation

Samples for E. coli (a subset of fecal coliform) were analyzed during the study in order to conduct a general assessment of potential impairment to recreational use. The bacteria data is summarized in Table 4 following this discussion. Comparing E. coli results to the Tulare Basin Plan water quality objective for a single maximum fecal coliform concentration (400 MPN/100-ml), indicated three potential exceedances out of 123-samples:

DER030 Deer Creek @ R. 264 on 6/24/03	(500 MPN/100-mL)
LKI040 Lower Kings River, S. Fork W Jackson Ave.	(900 MPN/100-mL)
LKI060 Lower Kings River, N. Fork @ 22nd Ave.	(>1,600 MPN/100-ml)

Further evaluation of the E. coli results against USEPA Guidelines for various levels of contact recreation (full body at 235 MPN to infrequent contact at >574 MPN), indicated only three other occasions when contact recreation may have been limited to moderate full body contact.

TUR050 Tule River @ Globe Road on 3/24/03	(240 MPN/100-mL)
DER030 Deer Creek @ Road 264 on 6/24/03	(500 MPN/100-mL)
KER110 Lake Isabella @ Calloway Weir on 5/26/04)	(300 MPN/100-mL)

In general, indications of impairment of contact recreation appeared limited within the Tulare Lake Basin during the course of this study.

Future monitoring activities in the basin should evaluate baselines and potential sources of reduced dissolved oxygen as well as seasonally elevated pH and E. coli concentrations.

TABLE 3
Dissolved Oxygen (mg/L)
Sampling Event Data
FYs 2002-2003 and 2003-2004

	Site Description	Site ID	IRRIGATION SEASON FY 2002-2003	IRRIGATION SEASON FY 2003-2004	LOW WATER SEASON FY 2002-2003		LOW WATER SEASON FY 2003-2004	STORMWATER SEASON FY 2002-2003	STORMWATER SEASON FY 2003-2004	HIGH WATER SEASON FY 2002-2003	HIGH WATER SEASON FY 2003-2004
Kings River Drainage Area											
upper watershed	Kings River	KIN050				8.54		13..52		8.87	
	Kings River	KIN010		8.57		8.76	10.03	12.20		9.06	
	Lewis Creek	KIN020		8.72		9.16	10.00	15.52		8.87	
	Lewis Creek	LEW010		8.01			10.37	11.62		8.98	
	Grizzly Creek	KIN040		8.36		8.82	10.28	13.94		8.81	
	Tenmile Creek	TEN010		7.15		8.82	9.51	12.22		8.56	
	Long Meadow Creek	HUM030		5.75		6.58	8.02	12.30		8.09	
	Tenmile Creek	HUM020		6.25		7.45	8.15	14.30		8.55	
	Hume Lake Dam	HUM010		6.24		8.12	8.75	8.71		7.40	
lower watershed	Kings River - Fresno Weir	LKI010	10.69	10.84	8.55	9.23	8.30	11.41	12.96	11.36	
	Kings River - Peoples Weir	LKI020	10.07	8.73	7.19			8.04	6.50	10.70	
	Kings River - Island Weir	LKI030	9.95								
	Kings River S. Fork	LKI040	7.54	9.00	7.50		7.40	11.22	11.54	9.09	
	Kings River S. Fork	LKI050	7.12	5.30	7.14		7.80	7.89	10.83	2.05	
	Kings River N. Fork	LKI060	8.67	14.10							
Kern River Drainage Area											
upper watershed	Springhill	KER010	8.35	10.05	8.71			9.65	9.51	11.19	
	River Kern Beach	KER020	10.01	10.24	9.21			9.52	11.53	10.92	
	Riverside Park	KER030	10.4	9.85	9.55			10.79	11.88	11.48	
	Tillie Creek	ISA010	9.45	9.65	8.17			5.49	11.22	11.46	
	Boulder Gulch	ISA020	8.6	9.51	7.81			5.24	11.3	11.37	
	Pioneer Point	ISA030						4.46	11.75		
	Main Dam	ISA040	8.14	9.42	6.03			4.72	11.2	10.36	
	So. Fork Rec.	ISA050	8.31	9.21	7.85			5.21	12.44	11.39	
	French Gulch	ISA060	8.85	9.44	6.53			4.2	11.45	10.63	
	Camp 9	ISA070	9.85	9.47	7.95				10.88	11.55	
	Hanning Flat	ISA080	9.5	9.5	7.95			5.91		11.31	
	Wofford Heights	ISA090	10.74							10.6	
lower watershed	Keyesville Rec Area	KER040	8.92	9.59	8.2		8.6	8.35	10.72	11.01	
	Democrat	KER050	10.2	9.73	9.14		8.6	12.76	11.55	10.66	
	Lower Richbar	KER060	10.1	9.95	9.41		11.5	12.43	11.8	11.92	
	Kern MM14/MM15	KER070	10.75	10.3	10.6		11.3	11.52	12.49	12.57	
	Rancheria Rd.	KER080	11.1	11.32	10.24		10.6	9.95	12.42	10.82	
	Hart Park	KER090		11.35	10.49		11.3	9.62	12.49	10.96	
	Beach Park	KER100									
	Calloway Weir	KER110		9.06	9.79			9.26		10.12	
Tule River Drainage Area											
upper watershed	Tule River - Powerhouse	TUR010			9.55			9.83		10.68	
	Camp	TUR020			9.76			9.56		10.74	
	Tule River - Rio Vista Day Use	TUR030			9.44			10.2		10.26	
	Tule River - Sequoia Station	TUR040			8.84			8.75		10.77	
	Tule River - Globe Rd. East	TUR050			6.63			11.06		10.44	
	Lake Success	SUC010			5.6			6.87		8.89	
	Lake Success	SUC020			4.51			3.76		10.25	
	Lake Success – Dam Wall	SUC030						3.45		9.77	
lower watershed	Tule River-Worth Avenue	TUR060	5.35								
	Tule River-NF	TUR070	9.6								
	Tule River	TUR100	7.4								
	Deer Creek-Road 120	DER010	8.73								
	Deer Creek-Gravel Mine	DER020	8.9								
	Deer Creek	DER030	7.78								
Kaweah River Drainage Area											
upper watershed	Kaweah River - Ash Mountain	KAR010			9.09			10.2		11.28	
	Kaweah River - Dinely Rd.	KAR020			8.56			10.09		11.1	
	Kaweah River - North Fork	KAR030			9.25			9.75		10.7	
	Kaweah River - Slick Rock	KAR040			9.32			9.41		10.38	
	Lake Kaweah - Greasy Creek	KAL010			5.47			5.55		10.35	
	Lake Kaweah - Horse Creek	KAL020								9.81	
	Lake Kaweah - Inflow	KAL030			6.07			7.18		9.43	
	Lake Kaweah - Dam Wall	KAL040			6.28			6.75		10.37	
lower watershed	Kaweah River - Lemon Cove	KAR050	9.3								
	St. Johns River	STJ010	10.4								
	St. Johns River	STJ020	12.2								
	Cross Creek	CCR010	11.68								

= value less than the minimum watercourse-specific Dissolved Oxygen Water Quality Objectives set forth in the Basin Plan

IRRIGATION SEASON = MAY, JUNE, JULY, AUGUST
LOW WATER SEASON = SEPTEMBER, OCTOBER, NOVEMBER
STORMWATER SEASON = DECEMBER, JANUARY, FEBRUARY, MARCH
HIGH WATER SEASON = APRIL

TABLE 4
E. coli Results
(MPN/100 ml)
Sampling Event Data
FYs 2002-2003 and 2003-2004

	Site Description	Site ID	IRRIGATION SEASONS FY 2002-2003	IRRIGATION SEASONS FY 2003-2004	LOW WATER SEASONS FY 2002-2003	LOW WATER SEASONS FY 2003-2004	STORMWATER SEASONS FY 2002-2003	STORMWATER SEASONS FY 2003-2004	HIGH WATER SEASONS FY 2002-2003	HIGH WATER SEASONS FY 2003-2004
Kings River Drainage Area										
upper watershed	Kings River	KIN050								
upper watershed	Kings River	KIN010		30						
upper watershed	Lewis Creek	KIN020		4		<2				
upper watershed	Lewis Creek	LEW010		22		4				
upper watershed	Grizzly Creek	KIN040		<2		<2				
upper watershed	Tenmile Creek	TEN010		<2	50	17	<2			
upper watershed	Long Meadow Creek	HUM030		8	3	80	<2			
upper watershed	Tenmile Creek	HUM020		<2	2	11	7			
upper watershed	Hume Lake Dam	HUM010		<2		17				
lower watershed	Kings River - Fresno Weir	LKI010	4	4		30		2		
lower watershed	Kings River - Peoples Weir	LKI020	50	13	50	4	30	2	30	
lower watershed	Kings River - Island Weir	LKI030	130							
lower watershed	Kings River S. Fork	LKI040	30	900	2	4	4	4	30	
lower watershed	Kings River S. Fork	LKI050	170	170	130	50	8	2	170	
lower watershed	Kings River N. Fork	LKI060	50	>1600						
Kern River Drainage Area										
upper watershed	Springhill	KER010	4							
upper watershed	River Kern Beach	KER020	<2							
upper watershed	Riverside Park	KER030	4							
upper watershed	Tillie Creek	ISA010	<2							
upper watershed	Boulder Gulch	ISA020	<2							
upper watershed	Pioneer Point	ISA030								
upper watershed	Main Dam	ISA040	4							
upper watershed	So. Fork Rec.	ISA050	2							
upper watershed	French Gulch	ISA060	<2							
upper watershed	Camp 9	ISA070	<2							
upper watershed	Hanning Flat	ISA080	<2							
upper watershed	Wofford Heights	ISA090	<2							
lower watershed	Keyesville Rec Area	KER040	<2							
lower watershed	Democrat	KER050	11	8	130	<2	9	8	2	
lower watershed	Lower Richbar	KER060	2	4	50	2	23	2	2	
lower watershed	Kern MM14/MM15	KER070	2	8	9	2	13	2	2	
lower watershed	Rancheria Rd.	KER080	4	7	13	17	4	7	2	
lower watershed	Hart Park	KER090		8	50	13	2	11	13	
lower watershed	Calloway Weir	KER110		300	8				13	
Tule River Drainage Area										
upper watershed	Tule River - Powerhouse	TUR010								
upper watershed	Tule River - Lower Coffee Camp	TUR020			13		17		8	
upper watershed	Tule River - Rio Vista Day Use	TUR030			130				30	
upper watershed	Tule River - Sequoia Station	TUR040								
upper watershed	Tule River - Globe Rd. East	TUR050			80				240	
upper watershed	Lake Success	SUC010								
upper watershed	Lake Success	SUC020					30			
upper watershed	Lake Success – Dam Wall	SUC030					70			
lower watershed	Tule River-Worth Avenue	TUR060	4							
lower watershed	Tule River-NF	TUR070	80							
lower watershed	Tule River	TUR100	170							
lower watershed	Deer Creek-Road 120	DER010	170							
lower watershed	Deer Creek-Gravel Mine	DER020	130							
lower watershed	Deer Creek	DER030	500							
Kaweah River Drainage Area										
upper watershed	Kaweah River - Ash Mountain	KAR010								
upper watershed	Kaweah River - Dinely Rd.	KAR020								
upper watershed	Kaweah River - North Fork	KAR030	4				23			
upper watershed	Kaweah River - Slick Rock	KAR040	2				13			
upper watershed	Lake Kaweah - Greasy Creek	KAL010					300			
upper watershed	Lake Kaweah - Horse Creek	KAL020								
upper watershed	Lake Kaweah - Inflow	KAL030					140			
upper watershed	Lake Kaweah - Dam Wall	KAL040								
lower watershed	Kaweah River - Lemon Cove	KAR050	2							
lower watershed	St. Johns River	STJ010	300							
lower watershed	St. Johns River	STJ020	220							
lower watershed	Cross Creek	CCR010	80							

= data exceeding the proposed E. coli water quality objective of 235MPN/100 mL (Basin Plan)

IRRIGATION SEASON = MAY, JUNE, JULY, AUGUST
LOW WATER SEASON = SEPTEMBER, OCTOBER, NOVEMBER
STORMWATER SEASON = DECEMBER, JANUARY, FEBRUARY, MARCH
HIGH WATER SEASON = APRIL

REFERENCES

California Regional Water Quality Control Board, Central Valley Region. 19 January 2001. *Watershed Management Initiative Chapter*.

California Regional Water Quality Control Board, Central Valley Region. February 2002. *Draft Tulare Lake Basin Surface Water Sampling Plan*.

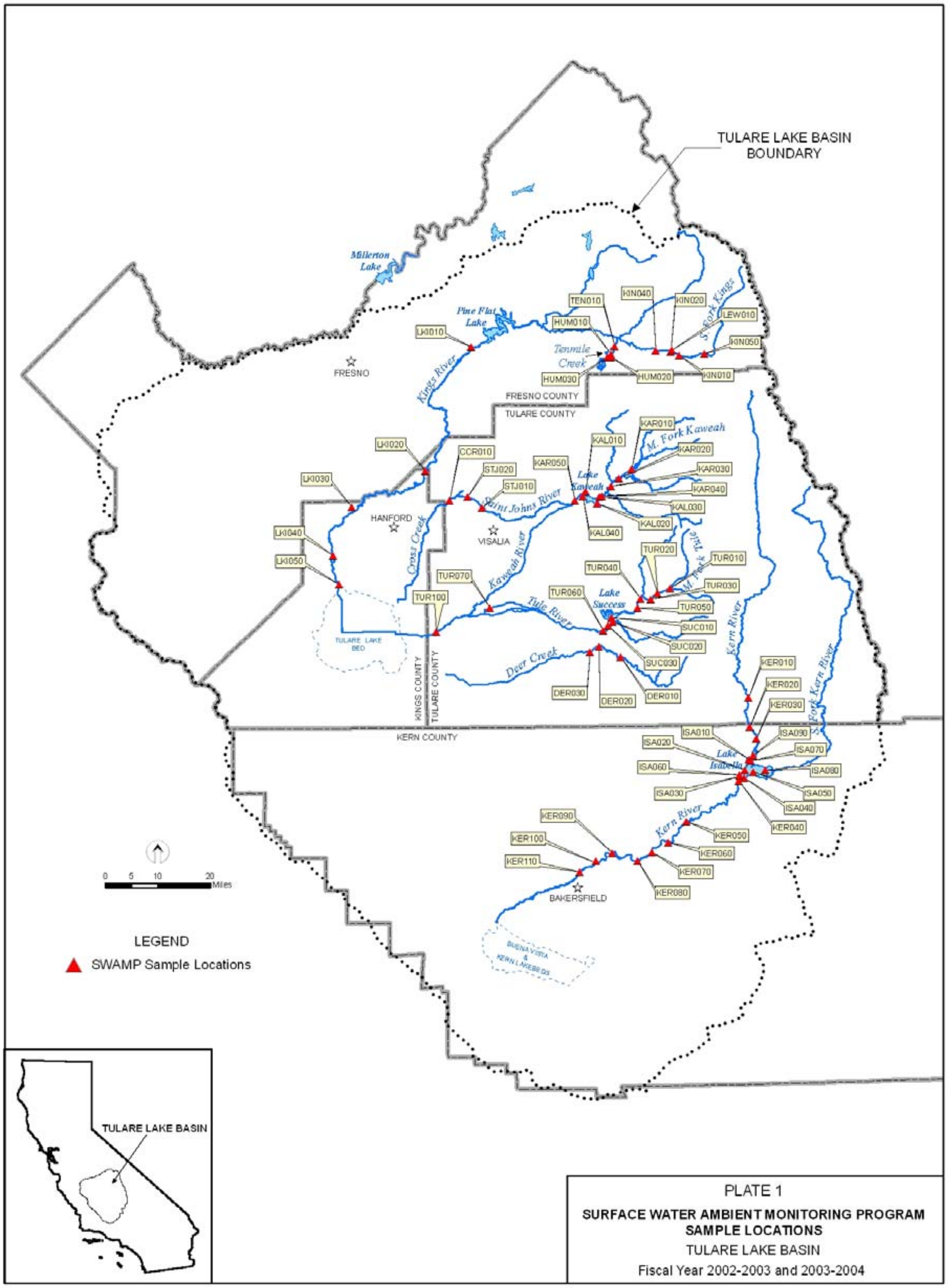
California Regional Water Quality Control Board, Central Valley Region. February 2002. *Draft Tulare Lake Basin Surface Water Ambient Monitoring Quality Assurance Project Plan.*

California Regional Water Quality Control Board, Central Valley Region. 1995. *The Water Quality Control Plan for the Tulare Lake Basin, Second Edition, 1995*.

State Water Resources Control Board, California Environmental Protection Agency. January 2002. Porter Cologne Water Quality Control Act, §13192.

State Water Resources Control Board, California Environmental Protection Agency. 30 November 2000. *Proposal for a Comprehensive Ambient Surface Water Quality Monitoring Program, Report to the Legislature*.

ATTACHMENT A
SUMMARY OF SAMPLE STATION LOCATIONS



ATTACHMENT A (CONTINUED)

SOUTH FORK KINGS RIVER-HUME LAKE–TENMILE CREEK-LOWER KINGS RIVER				
STATION ID	**SAMPLE STATION**	**LATITUDE**	**LONGITUDE**	**APPROXIMATE LOCATION**
KIN050	Kings River - Roads End	36.47370 N	118.34470 W	50 feet above inlet of Copper Creek into Kings River
KIN010	Kings River	36.78980 N	118.66600 W	Downstream of inflow of Hotel Creek into Kings River
KIN020	Kings River - Lewis Creek	36.48000 N	118.41390 W	Downstream of inflow of Lewis Creek into Kings River
LEW010	Lewis Creek	36.80328 N	118.69310 W	Upstream of California Conservation Corps. Primitive camp
KIN040	Kings River - Grizzly Creek	36.48250 N	118.44550 W	Downstream of inflow of Grizzly Creek into Kings River
TEN010	Kings River - Tenmile Creek	36.81673 N	118.88834 W	Downstream of inflow of Tenmile Creek into Kings River
HUM030	Hume Lake - Long Meadow Creek	36.78709 N	118.91350 W	Inlet of Long Meadow Creek into Hume Lake
HUM020	Hume Lake - Tenmile Creek	36.78650 N	118.90110 W	Inlet of Tenmile Creek into Hume Lake
HUM010	Hume Lake - Dam Site	36.79425 N	118.90010 W	At dam site
LKI010	Lower Kings River – Fresno Weir	36.8191 N	119.3805 W	Winton Co. Park – NE of Centerville on Trimmer Springs Road
LKI020	Lower Kings River – Peoples Weir	364849 N	119.5388 W	Peoples Weir just west of Hwy 99
LKI030	Lower Kings River – Island Weir	36.38752 N	119.78965 W	Island Weir just east of Hwy 41
LKI040	Lower Kings River – S. Fork	36.2558 N	119.8551 W	At Jackson Avenue bridge SW of Lemoore
LKI050	Lower Kings River – S. Fork	36.1789 N	119.8348 W	Hwy 41 near Stratford
LKLI060	Lower Kings River – N. Fork	36.3853 N	119.8515 W	22nd Avenue north of Elgin Avenue

ATTACHMENT A (CONTINUED)

KERN RIVER – LAKE ISABELLA				
STATION ID	**SAMPLE STATION**	**LATITUDE**	**LONGITUDE**	**APPROXIMATE LOCATION**
KER010	Springhill	35.86356 N	118.44830 W	Hwy 178 - Springhill primitive campground
KER020	River Kern Beach	35.78370 N	118.44513 W	Hwy 178 - River Kern Beach day use area
KER030	Riverside Park	35.05330 N	118.42470 W	Hwy 178 - Riverside Park - Kernville adjacent to playground equipment
ISA010	Tillie Creek	35.696000 N	118.450100 W	At entrance of Tille Creek into Lake Isabella
ISA020	Boulder Gulch	35.667790 N	118.464503 W	Adjacent to Boulder Gulch camping area
ISA030	Pioneer Point	35.6509 N	118. 48206 W	
ISA040	Main Dam	35.646630 N	118.468021 W	Near outflow of Lake Isabella - Main Dam
ISA050	So. Fork Rec.	35.662100 N	118.437070 W	Adjacent to the South Fork Picnic area
ISA060	French Gulch	35.655560 N	118.482570 W	Near the inflow of French Gulch drainage into Lake Isabella
ISA070	Camp 9	35.693000 N	118.443500 W	Adjacent to Camp 9 camping area
ISA080	Hanning Flat	35.666560 N	118.395710 W	Adjacent to Hanning Flat recreation area
ISA090	Wofford Heights	35.708180 N	118.435842 W	Adjacent to community of Wofford Heights
KER040	Keyesville Rec Area	35.63900 N	118.48460 W	Hwy 178 - downstream from Slippery Rock raft launch site
KER050	Democrat	35.53120 N	118.66310 W	US Forest Service Rd. 28S67 - Democrat primitive recreation area

ATTACHMENT A (CONTINUED)

KERN RIVER – LAKE ISABELLA				
STATION ID	**SAMPLE STATION**	**LATITUDE**	**LONGITUDE**	**APPROXIMATE LOCATION**
KER060	Lower Richbar	35.47620 N	118.7263 W	Hwy 178 - Lower Richbar picnic area
KER070	Ker MM14/MM15	35.45010 N	118.78260 W	Hwy 178 - site on road between Kern County mile marker 14 and mile marker 15
KER080	Rancheria Rd.	35.12652 N	118.33065 W	Rancheria Road day use area
KER090	Hart Park	35.44992 N	118.91624 W	Alfred Harrell Hwy - South end of Hart Park
KER110	Calloway Weir	35.39945 N	119.02661 W	Willow Dr. - Oildale - access to weir via Riverview Playground

ATTACHMENT A (CONTINUED)

KAWEAH RIVER-LAKE KAWEAH				
STATION ID	**SAMPLE STATION**	**LATITUDE**	**LONGITUDE**	**APPROXIMATE LOCATION**
KAR010	Kaweah River - Ash Mountain	36.48413 N	118.83594 W	Ash Mountain Park headquarters - Hwy 198
KAR020	Kaweah River - Dinely Rd.	36.46058 N	118.87920 W	Approx. 4 miles from Sequoia Nat'l Park Entrance
KAR030	Kaweah River - North Fork	36.43957 N	118.90598 W	North of Three Rivers - Hwy 198 and N. Fork Dr.
KAR040	Kaweah River - Slick Rock Rec. Area	36.41237 N	118.93784 W	North of Lake Kaweah – just off of Hwy 198
KAR050	Kaweah River – Lemon Cove below Terminus Dam	36.40091 N	119.02930 W	East of HWY 198 just below the outflow from Terminus Dam
STJ010	St. Johns River – City of Visalia	36.38419 N	119.34736 W	St. Johns river at the intersection with Demaree Avenue – north of the City of Visalia
STJ020	St. Johns River	36.41359 N	119.39467 W	St. Johns River at the intersection with Road 80 (Plaza Dr. north of the City of Visalia)
CCR010	Cross Creek	36.40462 N	119.45710 W	At intersection of Cross Creek and the west side of FWY 99
KAL010	Lake Kaweah - Greasy Creek	36.42588 N	118.99283 W	Inflow of Greasy Creek into Lake Kaweah
KAL020	Lake Kaweah - Horse Creek	36.39356 N	118.95432 W	Inflow of Horse Creek into Lake Kaweah
KAL030	Lake Kaweah - Inflow	36.41107 N	118.94529 W	Inflow of Kaweah River
KAL040	Lake Kaweah - Outflow	36.41391 N	119.00225 W	Outflow of Kaweah Lake

ATTACHMENT A (CONTINUED)

TULE RIVER-LAKE SUCCESS				
STATION ID	**SAMPLE STATION**	**LATITUDE**	**LONGITUDE**	**APPROXIMATE LOCATION**
TUR010	Tule River - Powerhouse	36.16143 N	118.70950 W	At the head of the Flume - Hwy 190
TUR020	Tule River - Lower Coffee Camp	36.14885 N	118.75241 W	Coffee Camp rec area - Hwy 190
TUR030	Tule River - Rio Vista Day Use Park	36.13247 N	118.77486 W	Day use area - Hwy 190
TUR040	Tule River - Sequoia N'tl Forest Fire Station	36.13459 N	118.81049 W	East of Springville - Hwy 190
TUR050	Tule River - Globe Rd. East	36.10913 N	118.81978 W	Globe Rd. - just south of Hwy 190 - west of Springville
SUC010	Lake Success	36.08452 N	118.90792 W	Inflow of Tule River into lake
SUC020	Lake Success	36.07178 N	118.90465 W	Middle of lake
SUC030	Lake Success – Dam Wall	36.06332 N	118.92060 W	Interior Wall of the Dam
TUR060	Tule River – Worth Avenue	36.04881 N	118.93771 W	Tule River crosses Worth Dr. just north of HWY 198 & just below Success dam
TUR070	Tule River - NF	36.11300 N	119.32182 W	West of Porterville and just east of FWY 99
TUR100	Tule River	36.04963 N	119.50507 W	Tule River at Poplar Avenue – East of HWY 43 - Corcoran
DER010	Deer Creek	35.97729 N	118.88051 W	E. Deer Creek where river crosses under Mountain Road120
DER020	Deer Creek	36.00734 N	118.95238 W	West of DER010; Most western crossing of Deer Creek and Road 120
DER030	Deer Creek	35.99168 N	118.982707 W	Deer Creek and Road 264

ATTACHMENT B

SUMMARY OF ANALYTICAL RESULTS

SOUTH FORK KINGS RIVER - HUME LAKE - TENMILE CREEK												
Sample Location	Sample Date	Water Temp (Celsius)	DO (mg/L)	pH	Electrical Conductivity (us /cm)	TKN (ug/L)	Ammonium as N (ug/L)	NO_2/NO_3 as N (ug/L)	TP (ug/L)	Soluble PO_4 (ug/L)	*E. coli* (MPN/ 100 ml)	Fecal Coliform (MPN/ 100 ml)
HUM010	9/25/2002	20.4	8.12	8.2	44.6	360	4.6	3.9	6.5	1.8	-	-
HUM020		20.6	7.45	8	44.7	310	3.7	3.2	9.6	1.5	2	2
HUM030		16.7	6.58	7.5	57.4	420	3.2	6.0	9.0	9.6	4	4
TEN010		15.3	8.82	8.2	47.4	220	<3	48.0	9.9	7.3	50	50
KIN010		13.3	8.76	7.5	44.9	<35	<3	13.0	3.7	<1	-	-
KIN020		13.8	9.16	7.3	47.2	<35	<3	9.5	4.6	2.0	-	-
LEW010		11.8	9.23	7.5	37.0	46	<3	3.2	16.0	11.0	-	-
KIN040		14.0	8.82	7.5	50.0	<35	<3	7.8	7.1	2.0	-	-
KIN050		11.7	8.54	8.1	44.0	<35	<3	28.0	4.9	1.8	-	-
HUM010	12/5/2002	4.7	8.71	7.4	53.5	390.0	9.1	10.0	30.0	7.1	-	-
HUM020		2.2	14.3	7.4	46.6	260.0	<3.0	12.0	27.0	6.4	7	7
HUM030		5.5	12.3	7.5	90.2	100.0	20.0	11.0	34.0	23	<2	<2
TEN010		3.4	12.22	7.3	60.0	250.0	9.6	21.0	20.0	7.1	<2	<2
KIN010		2.3	12.20	7.8	50.0	140.0	3.3	31.0	11.0	<1.0	-	-
KIN020		2.5	15.52	7.6	51.0	130.0	3.3	25.0	6.8	1.9	-	-
LEW010		2.3	11.62	7.7	44.1	95.0	<3.0	<2.0	19.0	6.4	-	-
KIN040		2.2	13.94	7.5	54.1	380.0	3.0	23.0	10.0	1.9	-	-
KIN050		2.4	13.52	8.3	55.0	59.0	7.6	53.0	27.0	16.0	-	-
HUM010	3/13/2003	12.0	7.4	7.8	50.2	290.0	8.3	24.0	73.0	6.3	-	-
HUM020		7.1	8.55	7.9	42.8	280.0	<3.0	11.0	38.0	11.0	-	-
HUM030		7.6	8.09	7.4	74.1	110.0	3.3	21.0	45.0	24.0	-	-
TEN010		10.5	8.56	7.8	51.0	160.0	<3.0	15.0	36.0	14.0	-	-
KIN010		6.8	9.06	8.5	43.0	100.0	<3.0	15.0	8.7	3.4	-	-
KIN020		7.8	8.87	7.6	42.9	110.0	<3.0	11.0	9.7	12.0	-	-
LEW010		6.5	8.98	8.2	35.0	100.0	<3.0	3.8	24.0	6.3	-	-
KIN040		8.0	8.81	7.6	45.4	95.0	<3.0	17.0	6.6	5.2	-	-
KIN050		6.3	8.87	8.5	50.2	86	<3.0	38	6.3	3.4	-	-
HUM010	4/27/2003	12.5	NR	7.62	45.4	130.0	3.6	5.4	23.0	4.6	-	-

SOUTH FORK KINGS RIVER - HUME LAKE - TENMILE CREEK

Sample Location	Sample Date	Water Temp (Celsius)	DO (mg/L)	pH	Electrical Conductivity (us /cm)	TKN (ug/L)	Ammonium as N (ug/L)	NO_2/NO_3 as N (ug/L)	TP (ug/L)	Soluble PO_4 (ug/L)	*E. coli* (MPN/ 100 ml)	Fecal Coliform (MPN/ 100 ml)
HUM020		8.1	NR	7.65	38.4	75.0	<3.0	5.9	22.0	6.0	-	-
HUM030		12.4	NR	7.58	47.6	150.0	9.5	9.3	32.0	4.2	-	-
TEN010		9.6	NR	7.82	58.6	140.0	<3.0	4.5	24.0	6.5	-	-
KIN010		7.6	NR	7.53	31.4	68.0	4.1	14.0	10.0	1.9	-	-
KIN020		NR	NR	7.62	NR	42.0	<3.0	11.0	11.0	1.4	-	-
LEW010		6.0	NR	7.58	29.0	83.0	<3.0	11.0	11.0	1.4	-	-
KIN040		9.3	NR	7.76	32.7	53.0	4.1	8.2	13.0	1.7	-	-
KIN050		9.3	NR	7.12	38.2	72.0	3.2	28.0	11.0	<1.0	-	-
HUM010	11/13/2003	8.5	8.75	8.4	79.9	370.0	<3.0	3.3	140	1.7	17	17
HUM020		8.7	8.15	8.2	46.0	620.0	7.8	3.5	30.0	1.7	11	11
HUM030		6.0.	8.02	7.4	80.9	340.0	4.9	18.0	37.0	18.0	80	80
TEN010		6.7	9.51	7.9	72.3	270.0	<3.0	21.0	16.0	4.9	17	17
KIN010		4.6	10.03	7.6	89.6	83.0	<3.0	24.0	5.5	3.7	-	-
KIN020		5.0	10.00	7.3	55.0	110.0	<3.0	18.0	9.2	2.4	<2	<2
LEW010		3.9	10.37	7.8	100.0	130.0	<3.0	2.0	15.0	5.6	4	4
KIN040		5.3	10.28	7.3	58.1	100.0	<3.0	11.0	5.5	3.7	<2	<2
HUM010	5/26/2004	18.9	6.24	9.14	41.0	407.9	6.0	7.9	19.3	2.9	<2	<2
HUM020		19.7	6.25	8.94	38.0	387.4	8.5	7.9	16.5	4.1	<2	<2
HUM030		19.9	5.75	8.06	42.1	402.8	9.0	13.3	26.0	3.6	8	8
TEN010		13.2	7.15	7.71	41.8	183.8	4.3	38.9	17.0	5.0	<2	<2
KIN010		7.1	8.57	6.94	17.4	73.1	2.0	33.9	5.0	1.8	30	30
KIN020		7.7	8.72	7.24	17.8	119.4	3.0	19.0	7.2	2.5	4	4
LEW010		7.3	8.01	7.07	17.7	54.0	2.3	3.3	8.4	3.4	22	22
KIN040		8.4	8.36	7.1	18.1	50.4	2.7	38.9	5.9	1.8	<2	<2

LOWER KINGS RIVER

Sample Location	Sample Date	Water Temp (Celsius)	DO (mg/L)	pH	Electrical Conductivity (us /cm)	TKN (ug/L)	Ammonium as N (ug/L)	NO_2 /NO_3 as N (ug/L)	TP (ug/L)	Soluble PO_4 (ug/L)	*E. coli* (MPN/ 100 ml)	Coliform (MPN/ 100 ml)
LKI010	9/10/2002	18.8	8.55	8.3	34.0	69.0	17.0	140.0	23.0	8.6	-	-
LKI020		22.0	7.19	8.1	103.5	82.0	60.0	36.0	50.0	21.0	50	50
LKI040		22.8	7.5	7.9	106.8	190.0	15.0	24.0	63.0	8.8	2	<2
LKI050		24.0	7.14	8.1	138.6	67.0	31.0	71.0	91.0	8.6	130	130
LKI010	12/6/2002	11.6	11.41	7.3	43.0	210.0	<3.0	110.0	21.0	12.0	-	-
LKI020		13.1	8.04	7.7	103.1	140.0	<3.0	33.0	25.0	32.0	30	30
LKI040		11.1	11.22	8.1	792.0	1000.0	6.5	58.0	110.0	4.4	4	4
LKI050		11.6	7.89	7.9	256.1	700.0	<3.0	38.0	86.0	3.0	8	8
LKI010	3/10/2003	9.3	11.36	8.5	51.6	120.0.0	0.0	51.0	14.0	1.1	-	-
LKI020		14.0	10.7	7.6	66.4	290.0.0	0.0	25.0	27.0	10.0	30	900
LKI040		17.1	9.09	8.0	1670.0	1300.0	41.0	21.0	210.0	52.0	30	70
LKI050		27.1	2.05	8.5	696.0	1500.0	710.0	50.0	78.0	29.0	170	170
LKI010	6/19/2003	13.0	10.69	8.0	38.9	-	-	-	-	-	4	4
LKI020		14.1	10.07	8.1	40.2	-	-	-	-	-	50	50
LKI030		16.9	9.95	8.1	41.0	-	-	-	-	-	130	130
LKI040		21.3	7.54	7.8	56.3	-	-	-	-	-	30	30
LKI050		23.3	7.12	7.8	68.0	-	-	-	-	-	170	170
LKI060		18.8	8.67	7.9	41.2	-	-	-	-	-	50	50
LKI010	11/18/2003	14.9	8.3	7.3	37.4	160.0	26.0	60.0	11.0	5.2	30	30
LKI020		16.2	-	7.3	95.2	210.0	43.0	89.0	59.0	24	4	4
LKI040		15.1	7.4	7.87	641	1100.0	53.0	96.0	160.0	6.3	4	4
LKI050		15.1	7.8	7.9	286.5	420.0	31.0	55.0	71.0	5.2	50	50
LKI010	1/21/2004	7.1	12.96	7.41	23.4	110.0	6.9	81.0	6.1	1.9	2	2
LKI020		10.4	6.5	7.39	89.8	140.0	67.0	110.0	59.0	19.0	2	2
LKI040		9.5	11.54	8.43	1384	1200.0	68.0	34.0	150.0	11.0	4	4
LKI050		9.7	10.83	8.5	398.1	720.0	17.0	61.0	84.0	2.8	2	2
LKI010	5/24/2004	10.5	10.84	7.2	35.8	103.9	1.9	39.1	8.7	2.8	4	8
LKI020		21.5	8.73	7.41	54.8	400.5	7.2	22.8	35.4	14.2	130	130
LKI040		24.2	9.0	8.5	2930	74.0	74.0	99.4	248.3	22.0	900	1600
LKI050		28.2	5.3	9.0	849.0	1658.4	590.7	18.9	99.3	23.3	170	300
LKI060		27.9	14.1	7.85	350.2	2211.8	204.3	95.5	349.5	23.8	> 1600	> 1600

KERN RIVER – LAKE ISABELLA													
Sample Location	Sample Date	Water Temp (Celsius)	DO (mg/L)	pH	Electrical Conductivity (us/cm)	TKN (ug/L)	Ammonium as N (ug/L)	NO_2 / NO_3 as N (ug/L)	TP (ug/L)	Soluble PO_4 (ug/L)	*E. coli* (MPN/ 100 ml)	Fecal Coliform (MPN/ 100 ml)
ISA010	9/17/2002-9/18/2002	20.0	8.17	8.3	120.9	89.0	10.0	6.2	62.0	20	-	-
ISA020		20.8	7.81	8.3	122.2	87.0	3.7	6.2	55.0	21	-	-
ISA040		20.8	6.03	8.3	117.9	74.0	38.0	44.0	62.0	27	-	-
ISA050		20.1	7.85	8.3	120.5	63.0	3.9	5.4	66.0	24	-	-
ISA060		20.6	6.53	8.3	117.9	89.0	21.0	36.0	55.0	26	-	-
ISA070		20.0	7.95	8.1	120.8	96.0	4.8	6.5	66.0	21	-	-
ISA080		19.5	7.95	8.3	120.6	47.0	27.0	8.5	79.0	26	-	-
KER010		18.8	8.71	8.6	172.6	90.0	<3	2.4	18.0	4.1	-	-
KER020		19.3	9.21	8.6	170.9	100.0	<3	2.9	15.0	3.4	-	-
KER030		20.3	9.55	8.5	168.9	100.0	<3	14.0	13.0	3.4	-	-
KER040		20.0	8.2	8.1	116.9	69.0	41.0	43.0	66.0	31	-	-
KER050		19.7	9.14	8.4	117.4	83.0	27.0	61.0	78.0	35	130	130
KER060		19.7	9.41	8.4	120.1	110.0	11.0	81.0	56.0	36	50	14
KER070		20.4	10.06	8.5	130.3	95.0	19.0	340.0	48.0	31	9	4
KER080		21.1	10.24	8.5	139.0	130.0	23.0	98.0	62.0	34	13	8
KER090		22.0	10.49	8.6	156.1	310.0	17.0	97.0	72.0	37	50	22
KER110		23.8	9.79	-	161.2	260.0	4.2	18.0	53.0	24	8	4
ISA010	12/11/2002-12/12/2002	10.1	5.49	7.8	167.9	850.0	170.0	68.0	140.0	76	-	-
ISA020		10.4	5.24	7.4	167.5	1000.0	190.0	66.0	140.0	76	-	-
ISA030		10.6	4.46	7.4	167.6	850.0	220.0	63.0	140.0	78.0	-	-
ISA040		10.4	4.72	7.7	168.1	570.0	210.0	65.0	140.0	76.0	-	-
ISA050		10.3	5.21	8.1	169.6	710.0	170.0	77.0	150.0	77.0	-	-
ISA060		10.8	4.2	7.5	168.2	580.0	240.0	64.0	140.0	74.0	-	-
ISA080		9.6	5.91	8.2	173.0	850.0	96.0	84.0	130.0	74.0	-	-
KER010		7.7	9.65	8.5	186.4	180.0	<3.0	6.6	50.0	20.0	-	-
KER020		8.8	9.52	7.9	190.4	110.0	<3.0	6.6	31.0	20.0	-	-
KER030		6.7	10.79	8.1	152.2	75.0	<3.0	17.0	31.0	19.0	-	-
KER040		10.5	8.35	7.8	169.0	1400.0	160.0	120.0	360.0	72.0	-	-
KER050		9.8	12.76	8.5	124.5	430.0	140.0	230.0	170.0	82.0	9	9
KER060		9.7	12.43	7.9	124.5	500.0	110.0	250.0	160.0	83.0	23	23

KERN RIVER – LAKE ISABELLA

Sample Location	Sample Date	Water Temp (Celsius)	DO (mg/L)	pH	Electrical Conductivity (us/cm)	TKN (ug/L)	Ammonium as N (ug/L)	NO_2 / NO_3 as N (ug/L)	TP (ug/L)	Soluble PO_4 (ug/L)	*E. coli* (MPN/ 100 ml)	Fecal Coliform (MPN/ 100 ml)
KER070	12/11/2002-12/12/2002	9.9	11.52	8.0	126.4	490.0	61.0	330.0	140.0	82.0	13	13
KER080		10.5	9.95	8.1	134.7	510.0	76.0	320.0	160.0	86.0	4	4
KER090		11.7	9.62	7.9	151.4	580.0	68.0	330.0	160.0	85.0	2	50
KER110		10.8	9.26	8.5	152.6	570.0	44.0	240.0	110.0	58.0		
ISA010	3/3/2003-3/4/2003	10.1	11.46	8.3	160.0	380.0	86.0	17.0	75.0	17.0	-	-
ISA020		9.7	11.37	8.1	164.9	600.0	18.0	23.0	90.0	26.0	-	-
ISA040		9.5	10.36	8.3	166.5	490.0	87.0	29.0	88.0	13.0	-	-
ISA050		9.8	11.39	8.9	172.6	410.0	11.0	16.0	78.0	15.0	-	-
ISA060		9.5	10.63	8.1	166.1	600.0	57.0	26.0	89.0	28.0	-	-
ISA070		10.	11.55	8.2	164.5	350.0	11.0	18.0	82.0	19.0	-	-
ISA080		9.2	11.31	8.8	173.5	390.0	15.0	17.0	84.0	15.0	-	-
ISA090		11.1	10.60	8.4	154.7	360.0	9.0	17.0	75.0	15.0	-	-
KER010		8.2	11.19	8.3	143.4	74.0	5.0	8.0	34.0	13.0	-	-
KER020		10.2	10.92	8.7	146.2	110.0	8.0	11.0	33.0	11.0	-	-
KER030		8.2	11.48	8.7	129.2	120.0	4.0	15.0	32.0	11.0	-	-
KER040		8.4	11.01	8.5	168.3	680.0	97.0	46.0	260.0	36.0	-	-
KER050		9.7	10.66	8.1	175.5	490.0	29.0	41.0	110.0	32.0	2	2
KER060		10.0	11.92	8.3	179.2	560.0	13.0	45.0	93.0	32.0	2	2
KER070		10.3	12.57	8.7	181.6	240.0	21.0	45.0	100.0	34.0	2	2
KER080		11.3	10.82	8.5	188.8	560.0	18.0	53.0	91.0	34.0	2	2
KER090		11.7	10.96	8.7	173.6	510.0	17.0	32.0	87.0	36.0	13	30
KER110		12.9	10.12	8.6	201.5	410.0	10.0	57.0	69.0	36.0	13	13
ISA010		20.5	9.45	9.0	105.4						<2	<2
ISA020		20.5	8.6	8.7	96.3						<2	<2
ISA040		20.3	8.14	8.5	91.2						4	4
ISA050		20.2	8.31	8.2	115.2						2	2
ISA060		20.0	8.85	8.5	90.7						<2	<2
ISA070		20.6	9.85	9.0	102.5						<2	<2
ISA080		20.8	9.50	9.2	120.						<2	<2
ISA090		21.1	10.74	9.1	93.3						<2	<2

KERN RIVER – LAKE ISABELLA

Sample Location	Sample Date	Water Temp (Celsius)	DO (mg/L)	pH	Electrical Conductivity (us/cm)	TKN (ug/L)	Ammonium as N (ug/L)	NO_2 / NO_3 as N (ug/L)	TP (ug/L)	Soluble PO_4 (ug/L)	*E. coli* (MPN/ 100 ml)	Fecal Coliform (MPN/ 100 ml)
KER010		17.5	8.35	8.5	75.7						4	4
KER020	6/25/2003-6/26/2003	17.0	10.01	8.2	75.3	samples not submitted for analysis					<2	<2
KER030		15.7	10.4	8.1	65.7						4	8
KER040		18.7	8.92	7.6	100.1						<2	<2
KER050		20.7	10.2	8.4	101.1						11	11
KER060		20.9	10.1	8.2	102.6						2	11
KER070		21.1	10.75	8.4	102.2						2	4
KER080		21.7	11.1	8.5	106.5						4	4
ISA010		14.0	-	8.4	-	570.0	25.0	39.0	49.0	17.0	-	
ISA020		15.5	-	8.0	-	450.0	58.0	59.0	58.0	26.0	-	
ISA040	11/3/2003-11/4/2003	15.5	-	7.9	-	450.0	83.0	41.0	51.0	27.0	-	-
ISA050		15.5	-	8.5	-	200.0	36.0	53.0	51.0	22.0	-	-
ISA060		15.5	-	7.9	-	480.0	79.0	43.0	48.0	27.0	-	-
ISA070		14.0	-	8.5	-	550.0	32.0	46.0	62.0	20.0	-	-
ISA080		12.5	-	10.2	-	380.0	15.0	24.0	47.0	15.0	-	-
KER010		8.0	-	8.3	-	160.0	14.0	16.0	47.0	34.0	-	-
KER020		9.0	-	8.3	-	160.0	13.0	15.0	58.0	37.0	-	-
KER030		9.0	-	8.3	-	170.0	14.0	15.0	62.0	38.0	-	-
KER040		14.4	8.6	8.4	152.3	440.0	81.0	55.0	78.0	33.0	-	-
KER050		12.6	8.6	8.4	152.6	400.0	15.0	97.0	52.0	39.0	<2	<2
KER060	11/3/2003-11/4/2003	12.0	11.5	8.4	158.7	330.0	7.4	91.0	42.0	35.0	2	<2
KER070		13.3	11.3	8.3	156.5	380.0	9.5	120.0	45.0	36.0	2	2
KER080		14.2	10.6	8.1	173.5	300.0	11.0	150.0	47.0	38.0	17	17
KER090		14.3	11.3	8.4	234.7	230.0	13.0	170.0	47.0	40.0	13	13
ISA010	2/3/2004-2/4/2004	6.5	11.22	8.8	102.8	551.2	16.5	23.2	87.7	7.9	-	-
ISA020		6.9	11.3	9.0	158.0	604.9	6.8	15.3	62.4	2.7	-	-
ISA040		7.0	11.75	8.95	103	577.0	4.7	11.8	50.6	2.9	-	-
ISA050		6.9	11.2	9.1	105.1	643.0	6.8	16.2	59.5	2.7	-	-
ISA060		7.4	12.44	9.1	156	620.6	4.7	10.0	57.9	2.2	-	-

KERN RIVER – LAKE ISABELLA

Sample Location	Sample Date	Water Temp (Celsius)	DO (mg/L)	pH	Electrical Conductivity (us/cm)	TKN (ug/L)	Ammonium as N (ug/L)	NO_2 / NO_3 as N (ug/L)	TP (ug/L)	Soluble PO_4 (ug/L)	*E. coli* (MPN/ 100 ml)	Fecal Coliform (MPN/ 100 ml)
ISA070		6.9	11.45	9.1	104.2	615.8	8.4	14.4	61.4	5.6	-	-
ISA080		6.7	10.88	8.7	126.9	589.2	11.5	20.6	87.7	5.2	-	-
KER010		5.8	9.51	8.5	160.8	636.9	21.9	106.1	191.4	26.9	-	-
KER020		5.9	11.53	8.55	176.4	227.9	13.1	65.6	114.5	23.2	-	
KER030		4.7	11.88	8.6	152.7	274.6	14.8	83.2	278.6	24.4	-	-
KER040		7.2	10.72	7.94	157.4	550.0	4.9	15.0	53.0	3.1	-	-
KER050		7.6	11.55	8.08	169.6	540.0	6.7	17.0	48.0	5.4	8	8
KER060		8.2	11.8	8.67	171.7	480.0	6.0	20.0	45.0	4.7	2	2
KER070		7.9	12.49	8.54	172.3	240.0	8.1	25.0	50.0	4.3	8	8
KER080		9.0	12.42	8.62	198.0	570.0	7.4	70.0	50.0	4.0	7	7
KER090		10.1	12.49	8.75	209.2	540.0	12.0	81.0	53.0	7.0	11	11
ISA010		17.3	9.65	8.55	98.6	388.4	6.8	9.9	54.0	11.0	-	-
ISA020		17.3	9.51	8.52	109.6	380.1	7.9	9.0	52.2	10.1	-	-
ISA040		16.7	9.42	8.3	119.7	246.5	5.9	8.1	32.0	11.9	-	-
ISA050		17.4	9.21	8.77	139.1	531.1	11.5	9.9	60.2	5.3	-	-
ISA060		17.1	9.44	8.48	119.1	324.8	0.00	5.4	31.7	10.1	-	-
ISA070		17.2	9.47	8.55	121.4	379.4	6.8	9.0	49.1	9.8	-	-
ISA080	5/25/2004-5/26/2004	17.4	9.5	8.77	132.5	454.9	6.8	9.6	57.1	6.0	-	-
KER010		13.2	10.05	7.93	55.4	421.7	9.2	21.6	126.3	11.7	-	-
KER020		14.7	10.24	7.83	56.3	277.0	10.3	24.6	190.9	13.7	-	-
KER030		14.4	9.85	7.78	59.2	732.4	22.3	42.1	550.9	18.3	-	-
KER040		16.5	9.59	8.14	118.5	240.3	16.0	19.0	40.7	15.4	-	-
KER050		16.7	9.73	8.26	119.4	243.1	15.2	19.0	43.8	18.6	8	8
KER060		18.1	9.95	8.37	121.4	238.2	8.5	24.0	45.6	21.2	4	4
KER070		18.1	10.3	8.4	121.0	284.6	18.0	28.6	46.6	21.6	8	8
KER080	5/25/2004-5/26/2004	18.4	11.32	8.44	127.8	337.9	12.0	32.2	46.0	21.8	7	7
KER090		19.9	11.35	8.66	132.3	320.6	10.0	26.8	61.8	25.3	8	8
KER110		23.0	9.06	7.91	136.4	419.6	4.7	5.8	33.8	14.5	300	300

TULE RIVER – LAKE SUCCESS

Sample Location	Sample Date	Water Temp (Celsius)	DO (mg/L)	pH	Electrical Conductivity (us /cm)	TKN (ug/L)	Ammonium as N (ug/L)	NO_2 /NO_3 as N (ug/L)	TP (ug/L)	Soluble PO_4 (ug/L)	E. coli (MPN/ 100 ml)	Fecal Coliform (MPN/ 100 ml)
SUC010	9/30/2002	22.8	5.6	7.5	247.7	380.0	13.0	18.0	67.0	5.7	-	-
SUC020		23.4	4.51	7.5	252.6	300.0	9.4	14.0	53.0	5.3	-	-
TUR010		13.6	9.55	7.9	293.5	<35	<3	<2	29.0	4.4	-	-
TUR020		15.6	9.76	8.1	304.8	<35	<3	<2	58.0	3.0	13	13
TUR030		17.7	9.44	8.1	315.4	81.0	<3	<2	37.0	7.5	130	130
TUR040		18.0	8.84	8.1	324.5	190.0	<3	1.6	55.0	21.0	-	-
TUR050		20.0	6.63	7.6	337.4	190.0	<3	33.0	37.0	10.0	80	80
SUC010	12/18/2002	9.4	6.87	7.7	142.6	1700.0	130.0	140.0	100.0	14.0	-	-
SUC020		11.5	3.76	7.2	145.1	740.0	130.0	150.0	100.0	13.0	30	30
SUC030		11.6	3.45	7.1	148.9	860.0	140.0	160.0	99.0	13.0	70	70
TUR010		7.4	9.83	8.3	145.4	180.0	<3	69.0	24.0	8.4	-	-
TUR020		5.8	9.56	8.3	145.0	160.0	<3	89.0	42.0	8.2	17	17
TUR030		6.5	10.2	7.9	139.9	260.0	<3	88.0	25.0	8.4	-	-
TUR040		7.3	8.75	7.9	125.8	230.0	<3	100.0	57.0	13.0	-	-
TUR050		8.1	11.06	7.7	128.5	290.0	<3	100.0	61.0	16.0	-	-
SUC010	3/24/2003	17	8.89	8.8	144.8	410.0	30.0	16.0	94.0	7.9	-	-
SUC020		16.9	10.25	8.4	144.5	560.0	27.0	3.7	77.0	3.2	-	-
SUC030		16.4	9.77	8.5	146.1	370.0	15.0	5.0	74.0	2.3	-	-
TUR010		8.3	10.68	8.6	158.7	110.0	5.4	6.6	33.0	4.6	-	-
TUR020		9.3	10.74	8.4	157.5	96.0	5.8	6.1	15.0	4.6	8	8
TUR030		10.2	10.26	8.5	304.5	120.0	4.8	6.0	32.0	5.1	30	30
TUR040		11.5	10.77	8.5	161.0	120.0	6.3	10.0	28.0	6.0	-	-
TUR050		12.2	10.44	8.5	141.2	150.0	5.8	14.0	39.0	8.1	240	240
TUR060	6/23/2003-6/24/2003	14.9	5.35	7.8	171.5	-	-	-	-	-	4	4
TUR070		18.1	9.6	8.4	33.0	-	-	-	-	-	80	110
TUR100	6/23/2003-6/24/2003	23.4	7.4	8.1	65.3	-	-	-	-	-	170	170
DER010		19.0	8.73	8.2	175.0	-	-	-	-	-	170	300
DER020		21.2	8.9	8.4	192.0	-	-	-	-	-	130	130
DER030		27.2	7.78	8.6	199.2	-	-	-	-	-	500	500

LAKE KAWEAH – KAWEAH RIVER

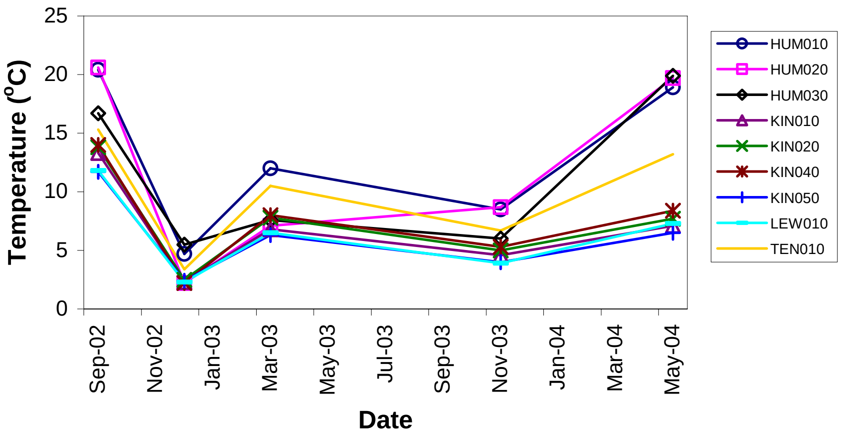
Sample Location	Sample Date	Water Temp (Celsius)	DO (mg/L)	pH	Conductivity (us/cm)	TKN (ug/L)	Ammonium as N (ug/L)	NO_2 /NO_3 as N (ug/L)	TP (ug/L)	Soluble PO_4 (ug/L)	*E. coli* (MPN/ 100 ml)	Fecal Coliform (MPN/ 100 ml)
KAR010	9/9/2002	20.3	9.09	8.3	91.7	120.0	<3	6.0	9.3	1.7	-	-
KAR020		19.8	8.56	8.3	107.4	150.0	5.2	<2	11.0	1.7	-	-
KAR030		20.6	9.25	8.3	112.1	140.0	4.1	<2	10.0	2.4	4	30
KAR040		21.3	9.32	8.3	122.3	120.0	5.5	3.8	17.0	2.4	2	23
KAL010		23.7	5.47	8.1	93.6	110.0	7.3	5.0	29.0	3.5	-	-
KAL030		23.3	6.07	7.9	98	200.0	14.0	6.7	36.0	5.8	-	-
KAL040		23.1	6.28	8.5	95.1	88.0	10.0	4.4	27.0	2.6	-	-
KAL010	12/17/2002	10.4	5.55	7.4	65	720.0	130.0	100.0	62.0	10.0	300	300
KAL030		10.0	7.18	7.5	65.6	370.0	63.0	71.0	72.0	5.9	140	140
KAL040		10.3	6.75	7.9	64.7	580.0	110.0	89.0	55.0	10.0	-	-
KAR010		5.8	10.20	8.6	38.7	170.0	0.0	99.0	29.0	3.4	-	-
KAR020		7.5	10.09	8.6	46.0	370.0	5.3	140.0	56.0	15.0	-	-
KAR030		8.1	9.75	8.3	54.6	300.0	11.0	130.0	47.0	14.0	-	-
KAR040		8.6	9.41	8.3	58.1	340.0	9.5	130.0	50.0	14.0	-	-
KAL010	3/25/2003	15.5	10.35	8.1	137.0	220.0	7.5	5.2	25.0	2.5	-	-
KAL020		14.9	9.81	7.8	132.3	290.0	0.0	5.2	50.0	3.2	-	-
KAL030		15.2	9.43	7.6	72.6	290.0	4.0	4.9	55.0	2.5	-	-
KAL040		15.4	10.37	8.2	72.3	130.0	28.0	4.0	35.0	1.6	-	-
KAR010		9.6	11.28	8.0	43.3	120.0	4.4	23.0	29.0	3.4	-	-
KAR020		11.3	11.10	8.2	53.0	110.0	9.6	14.0	23.0	3.2	-	-
KAR030		12.9	10.70	8.3	58.7	120.0	10.0	10.0	18.0	3.0	23	23
KAR040		13.2	10.38	8.5	118.2	150.0	0.0	11.0	25.0	3.4	13	13
KAR050	6/23/2003	18.9	9.3	8.0	40.3	<1.0*	<1.0*	<0.4*	-	<0.3*	2	2
STJ010		20.9	10.40	9.2	45.2	<1.0*	<1.0*	<0.4*	-	-	300	300
STJ020		22.5	12.20	9.6	47.7	<1.0*	<1.0*	<0.4*	-	-	220	220
CCR010		22.0	11.68	9.1	45.6	<1.0*	<1.0*	<0.4*	-	-	80	80

Abbreviations and Acronyms

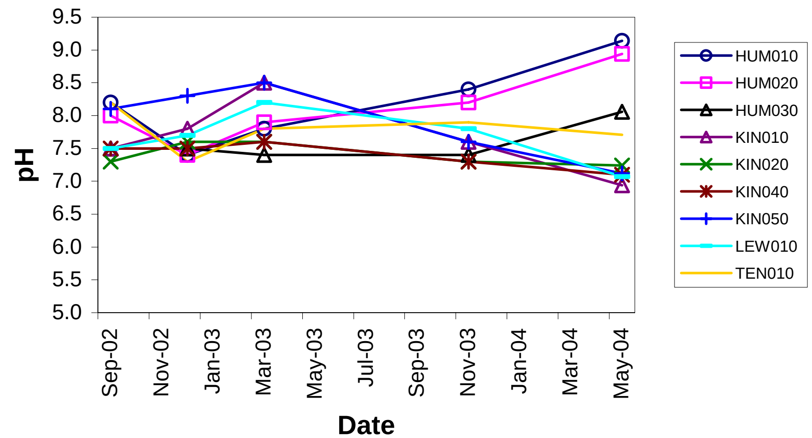
DO	dissolved oxygen	TKN	total Kjeldahl nitrogen
mg/L	milligrams per liter	NO_2	nitrite
us/cm	microSiemens per centimeter	NO_3	nitrate
ug/L	micrograms per liter	PO_4	phosphate
MPN/100 ml	most probable number per 100 milliliters	TDS	total dissolved solids
NR	no record	*	indicates method detection limit
TP	total phosphorus		
	indicates data collected in the field		indicates analytical data provided by laboratory

ATTACHMENT C - UPPER KINGS RIVER (HUME LAKE AND SOUTH FORK OF THE KINGS RIVER)

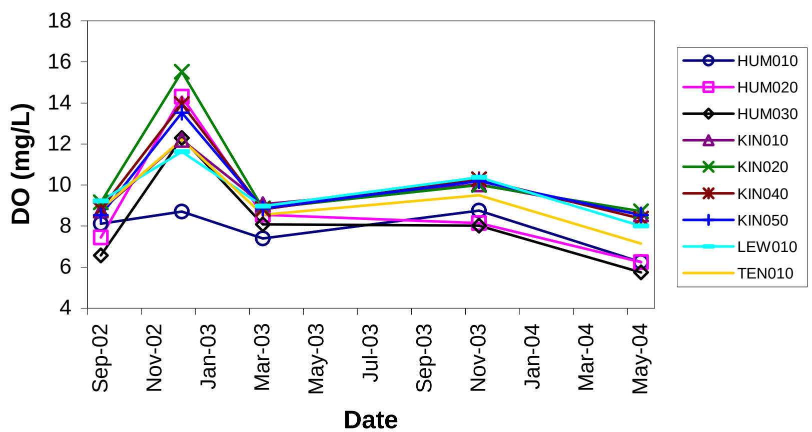
Upper Kings River Water Temperatures
September 2002 thru May 2004



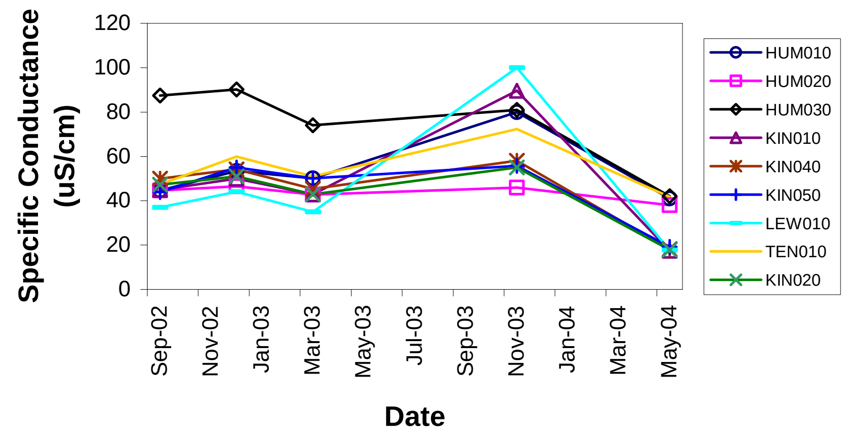
Upper Kings River pH Values
September 2002 thru May 2004



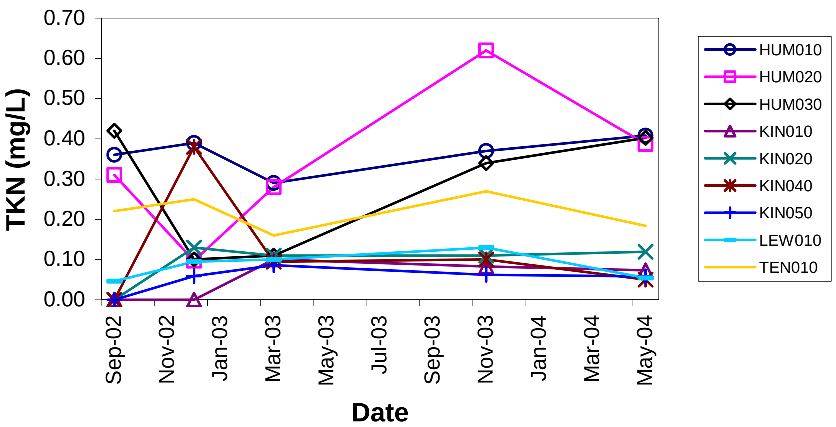
Upper Kings River Dissolved Oxygen (DO) Concentrations
September 2002 thru May 2004



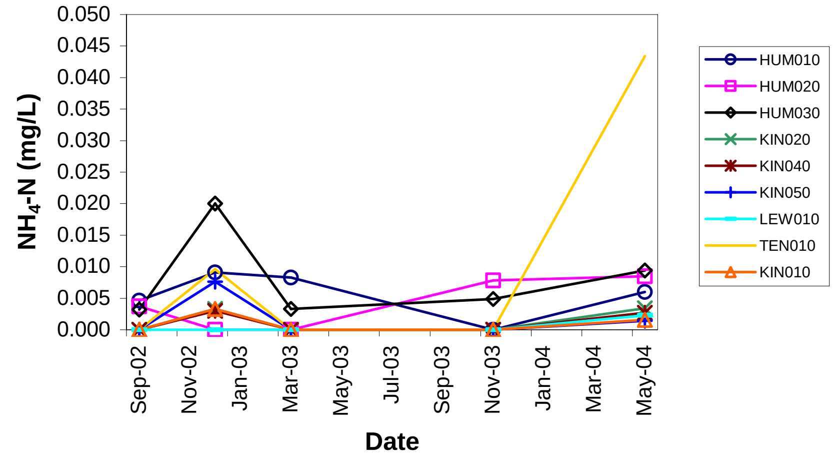
Upper Kings River Specific Conductance Values
September 2002 thru May 2004



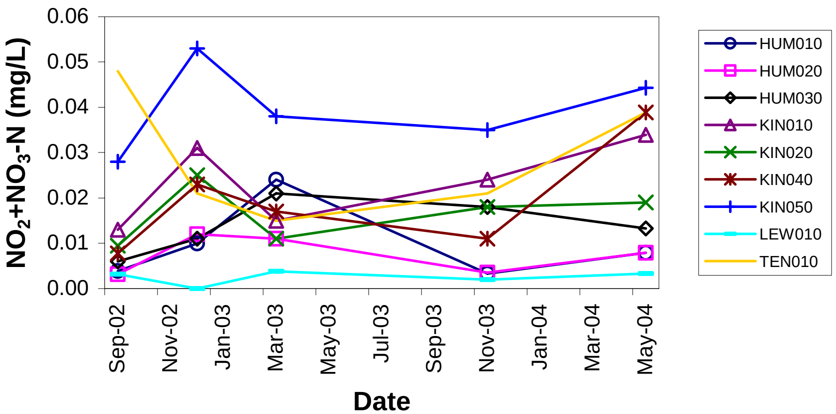
Upper Kings River Total Kjeldahl Nitrogen (TKN) Concentrations September 2002 thru May 2004



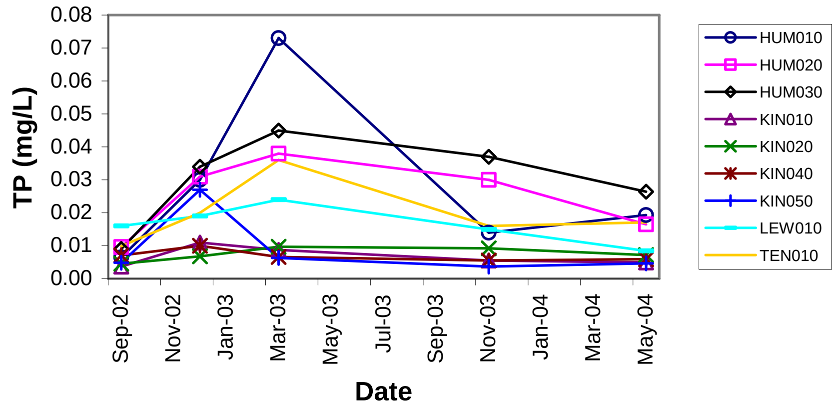
Upper Kings River Ammonium as N (NH_4-N) Concentrations September 2002 thru May 2004



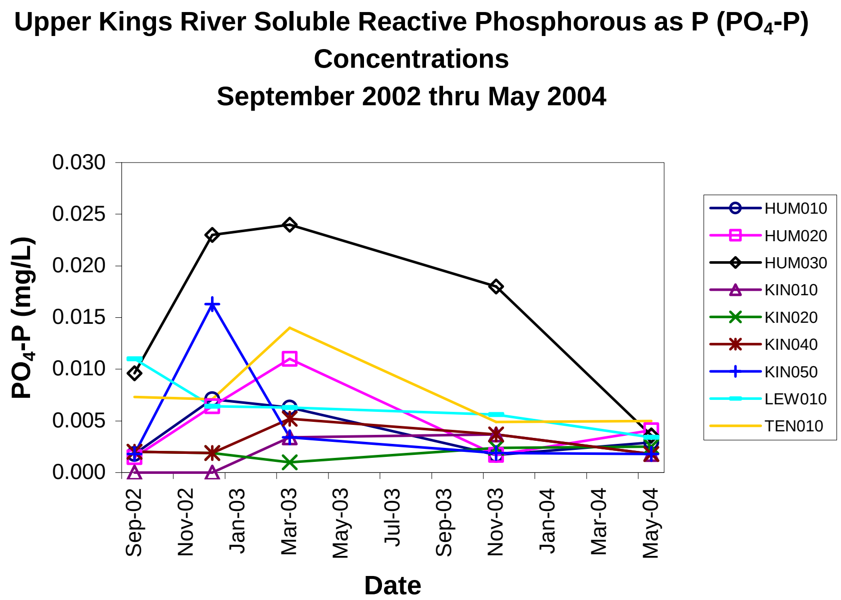
Upper Kings River Nitrite + Nitrate as N (NO_2+NO_3-N) Concentrations September 2002 thru May 2004



Upper Kings River Total Phosphorous (TP) Concentrations September 2002 thru May 2004



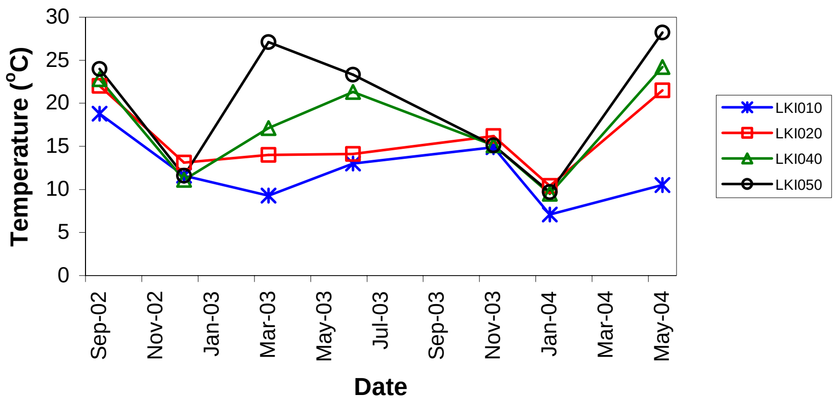
mg/L = milligrams/liter



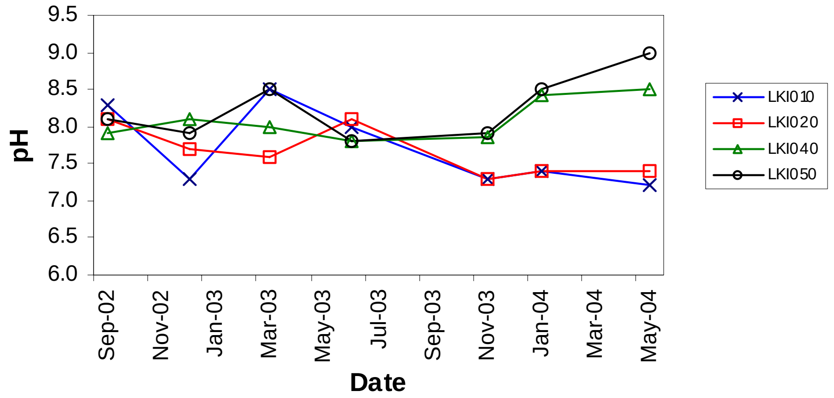
mg/L = milligrams/liter

ATTACHMENT D – LOWER KINGS RIVER

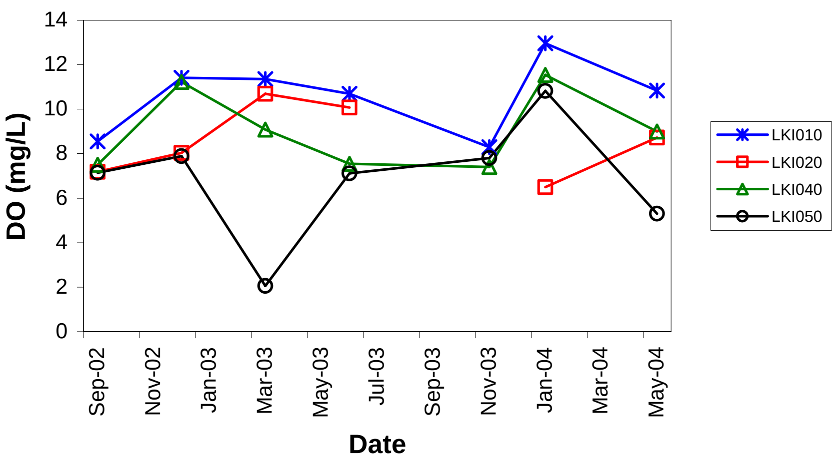
Lower Kings River Water Temperatures
September 2002 thru May 2004



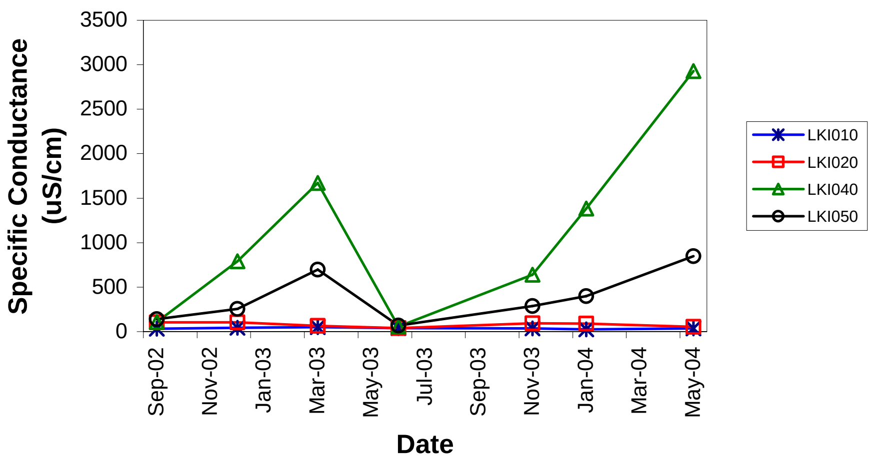
Lower Kings River pH Values
September 2002 thru May 2004



Lower Kings River Dissolved Oxygen (DO) Values
September 2002 thru May 2004

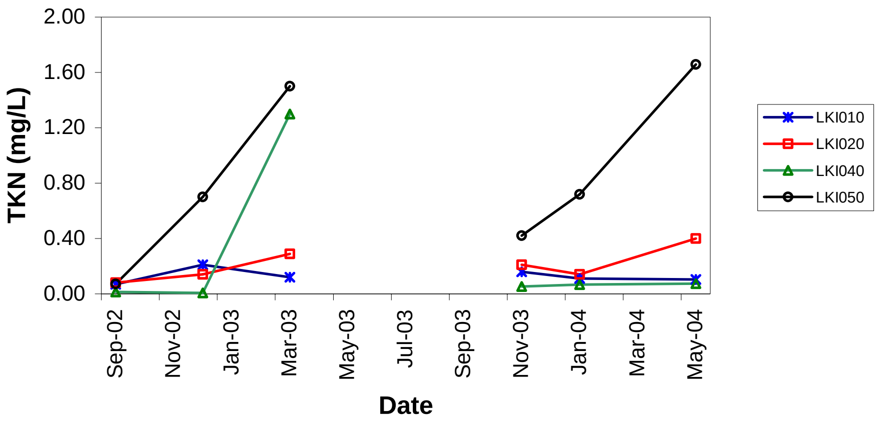


Lower Kings River Specific Conductance Values
September 2002 thru May 2004

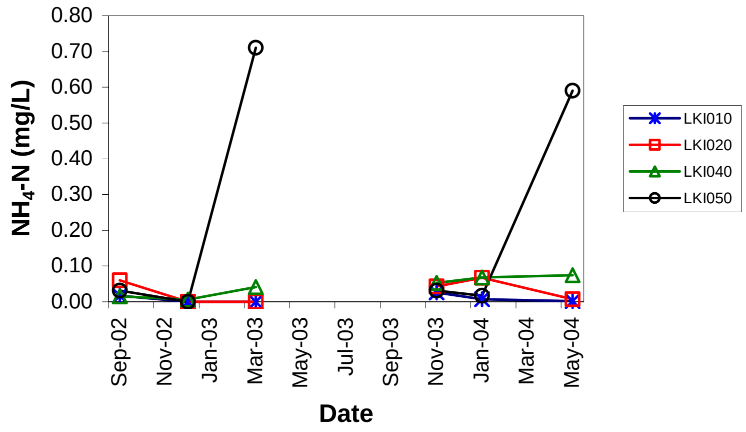


uS/cm = microSiemens/centimeter
mg/L = milligrams/liter

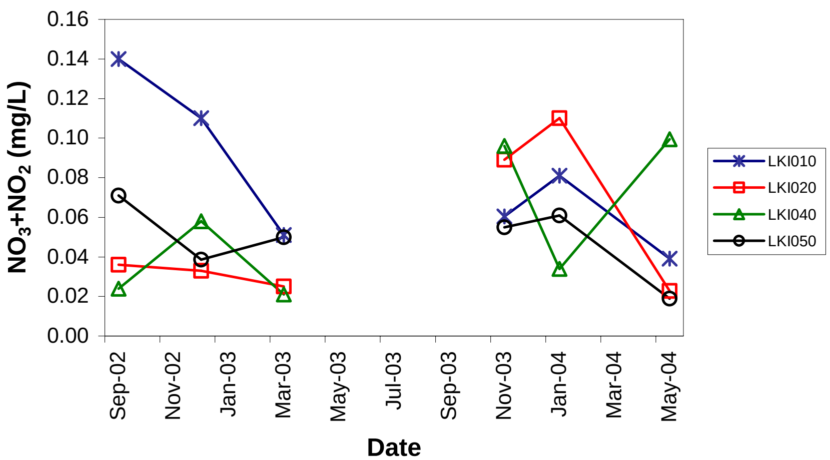
Lower Kings River Total Kjeldahl Nitrogen (TKN) Concentrations September 2002 thru May 2004



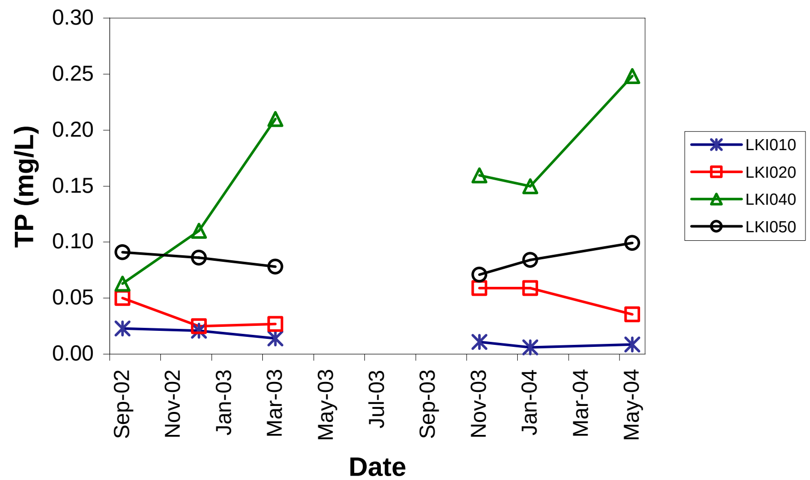
Lower Kings River Ammonium as N (NH_4-N) Concentrations September 2002 thru May 2004



Lower Kings River Nitrite + Nitrate as N (NO_2+NO_3 – N) Concentrations September 2002 thru May 2004

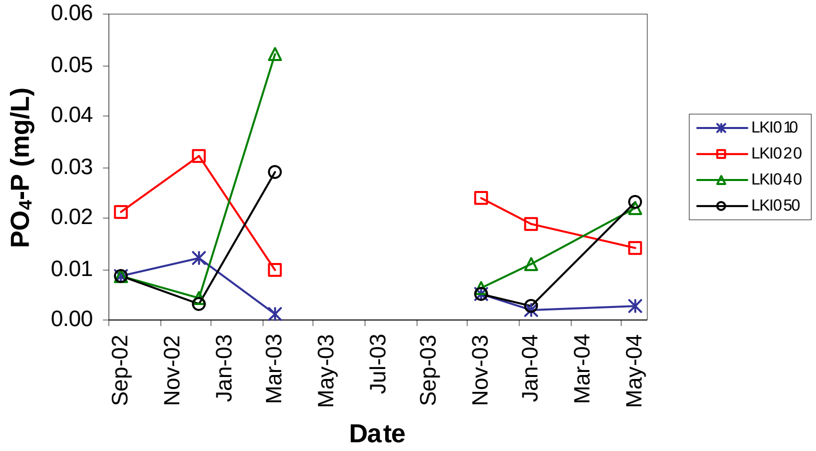


Lower Kings River Total Phosphorous (TP) Concentrations September 2002 thru May 2004



mg/L = milligrams/liter

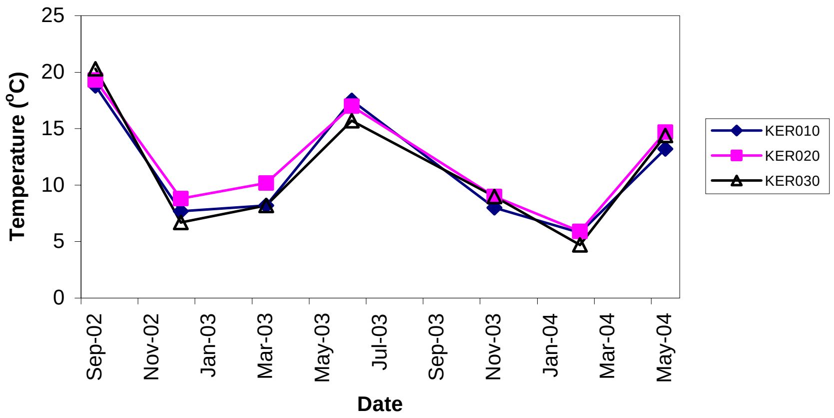
Lower Kings River Soluble Reactive Phosphorous as P (PO_4-P) Concentrations September 2002 thru May 2004



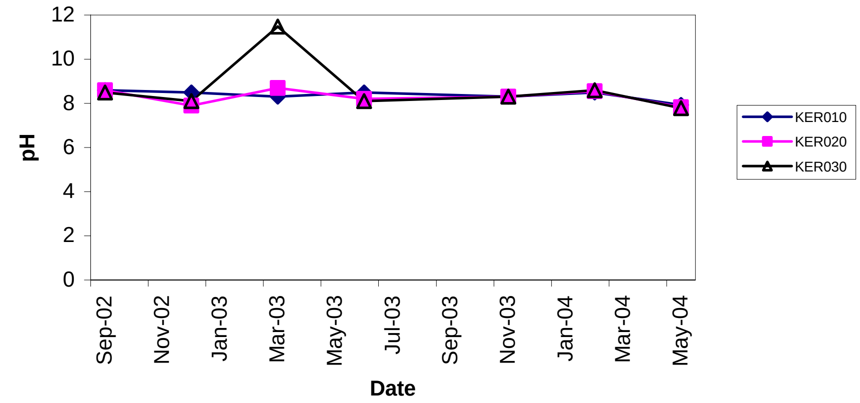
mg/L = milligrams/liter

ATTACHMENT E – Part I: UPPER KERN RIVER

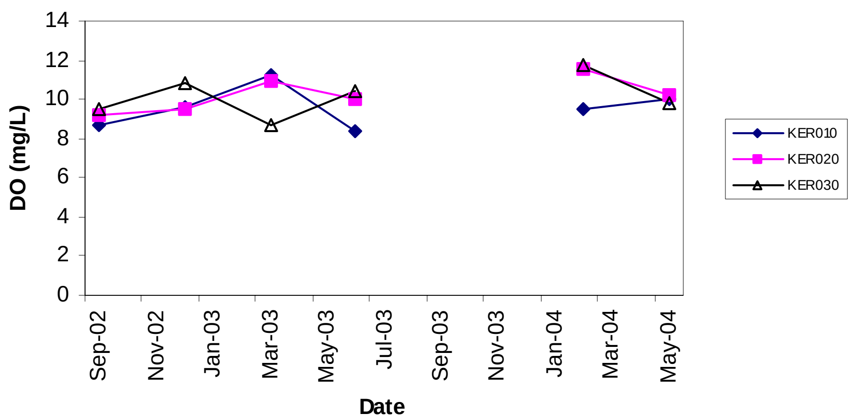
Upper Kern River Water Temperatures
September 2002 thru May 2004



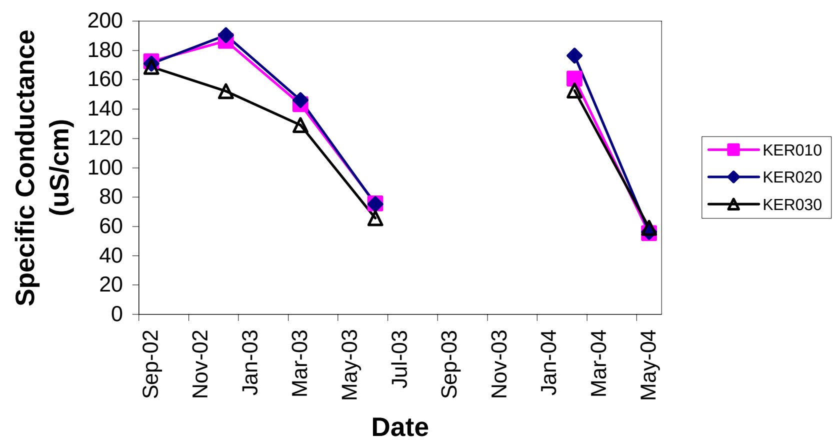
Upper Kern River pH Values
September 2002 thru May 2004



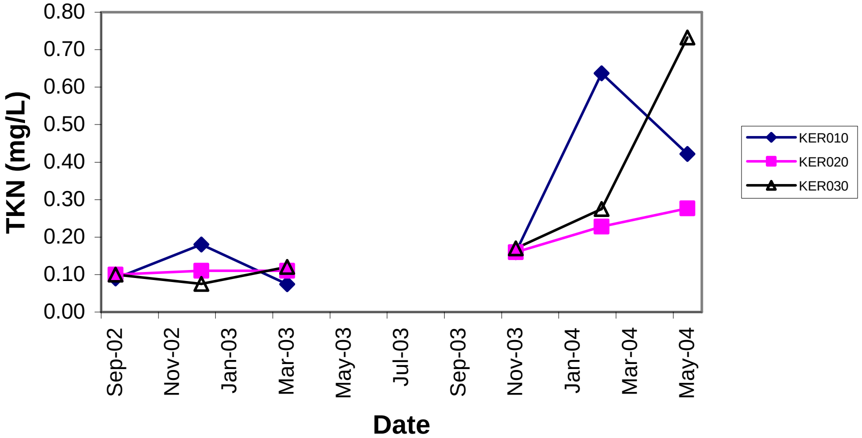
Upper Kern River Dissolved Oxygen (DO) Concentrations
September 2002 thru May 2004



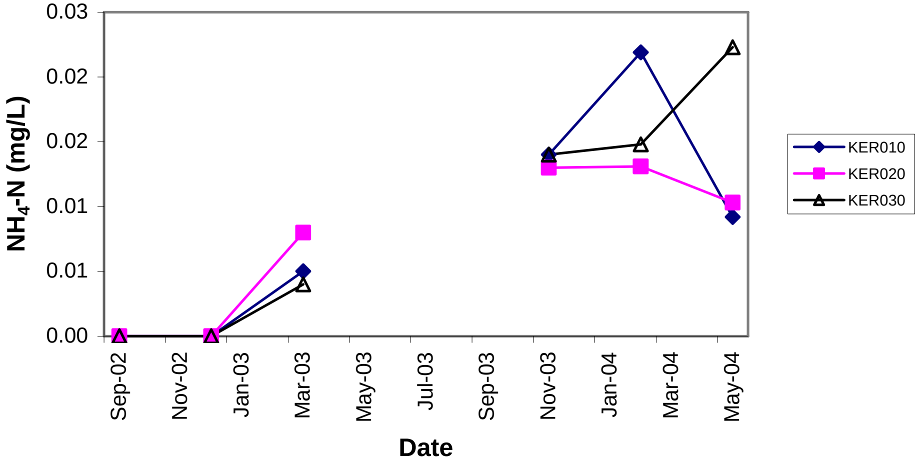
Upper Kern River Specific Conductance Values
September 2002 thru May 2004



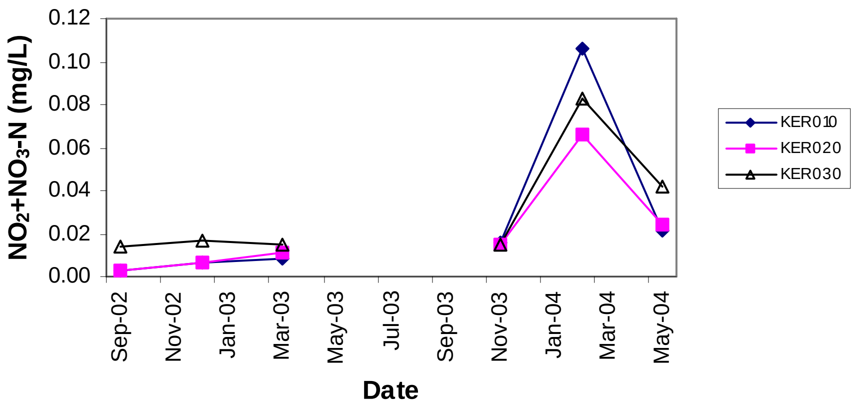
Upper Kern River Total Kjeldahl Nitrogen (TKN) Concentration
September 2002 thru May 2004



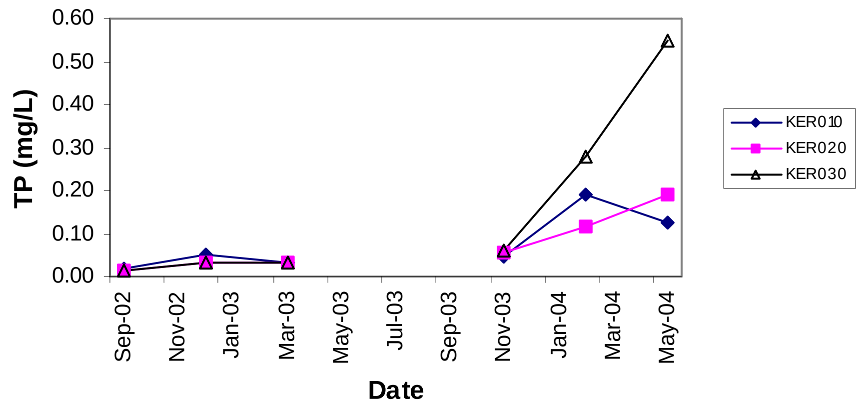
Upper Kern River Ammonium as N (NH_4-N) Concentrations
September 2002 thru May 2004



Upper Kern River Nitrite + Nitrate as N (NO_2+NO_3 – N) Concentrations
September 2002 thru May 2004

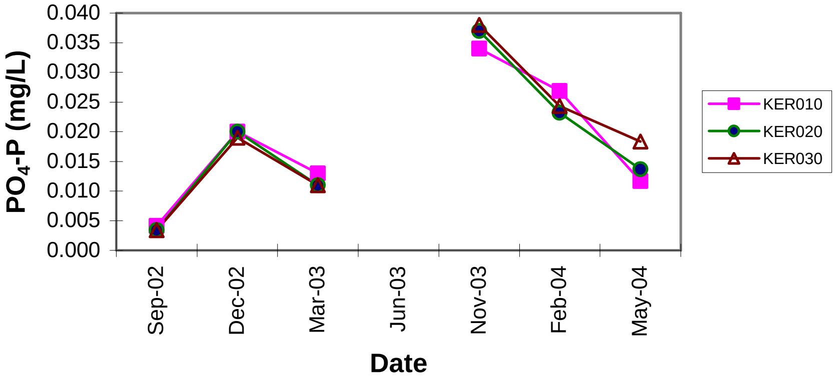


Upper Kern River Total Phosphorous (TP) Concentrations
September 2002 thru May 2004



mg/L = milligrams/liter

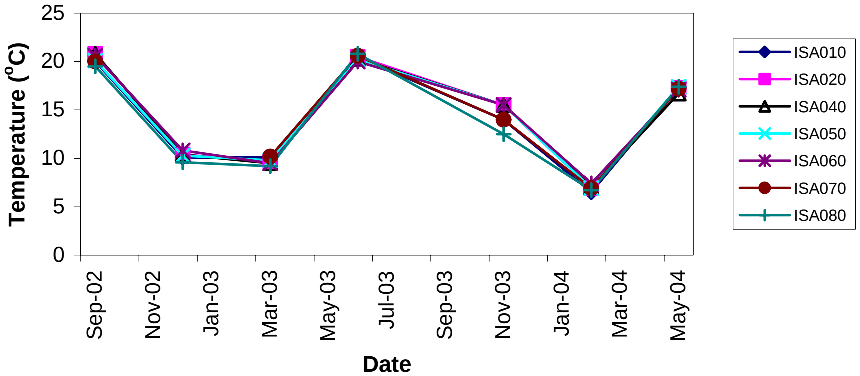
Upper Kern River Soluble Reactive Phosphorous as P (PO_4-P) Concentrations September 2002 thru May 2004



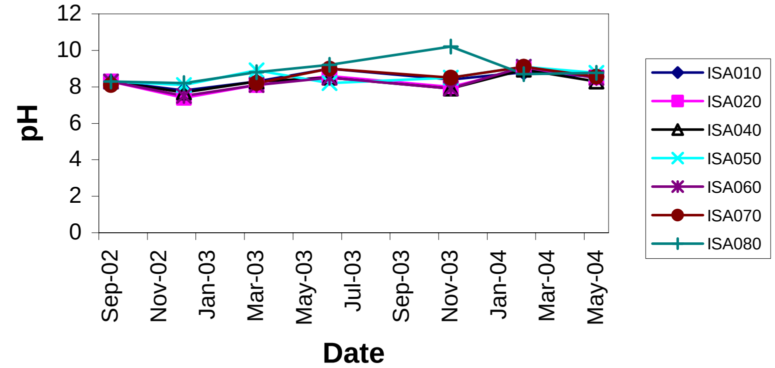
mg/L = milligrams/liter

ATTACHMENT E – Part II: LAKE ISABELLA

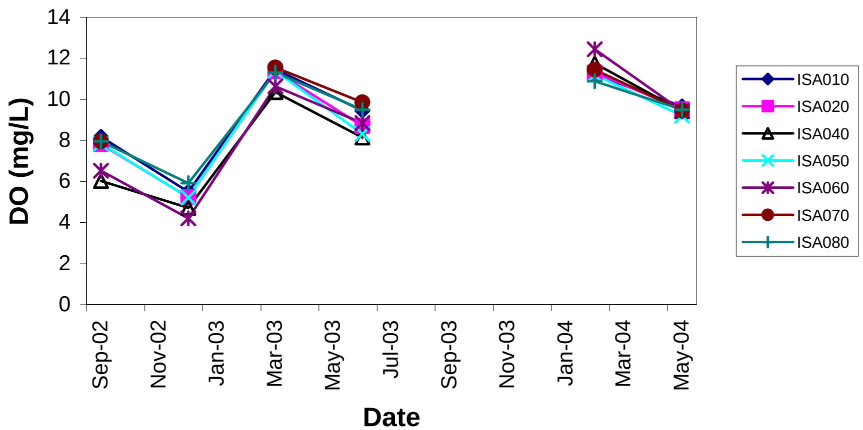
Lake Isabella Surface Water Temperatures
September 2002 thru May 2004



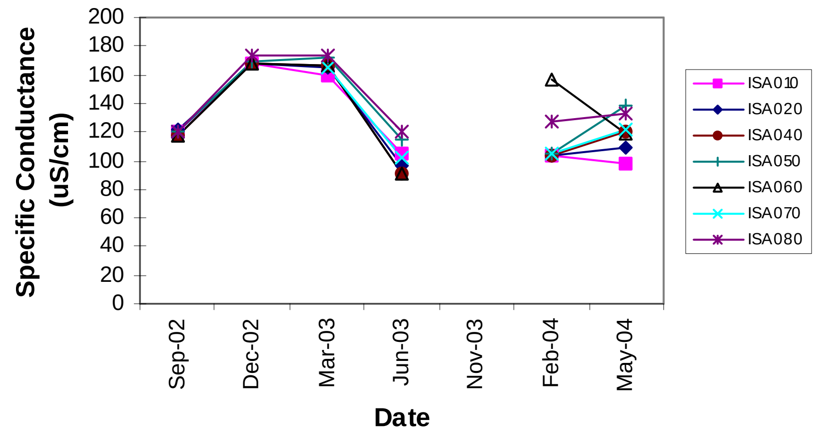
Lake Isabella Surface Water pH Values
September 2002 thru May 2002



Lake Isabella Surface Water Dissolved Oxygen (DO) Concentrations
September 2002 thru May 2004

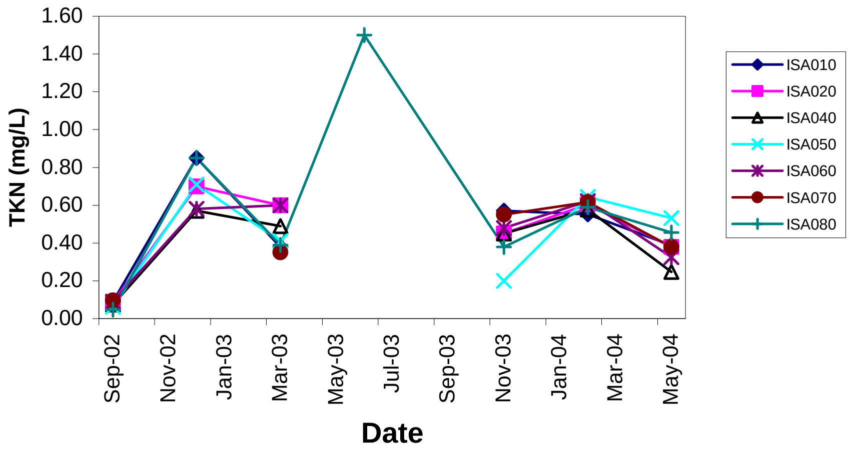


Lake Isabella Surface Water Specific Conductance Values
September 2002 thru May 2004

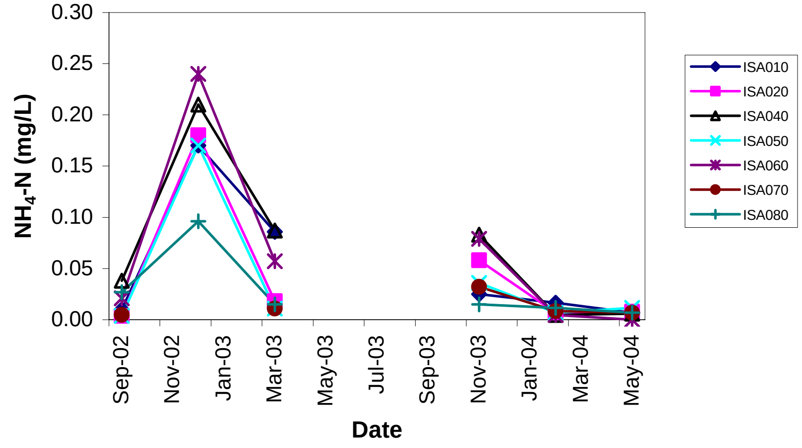


uS/cm = microSiemens/centimeter
mg/L = milligrams/liter

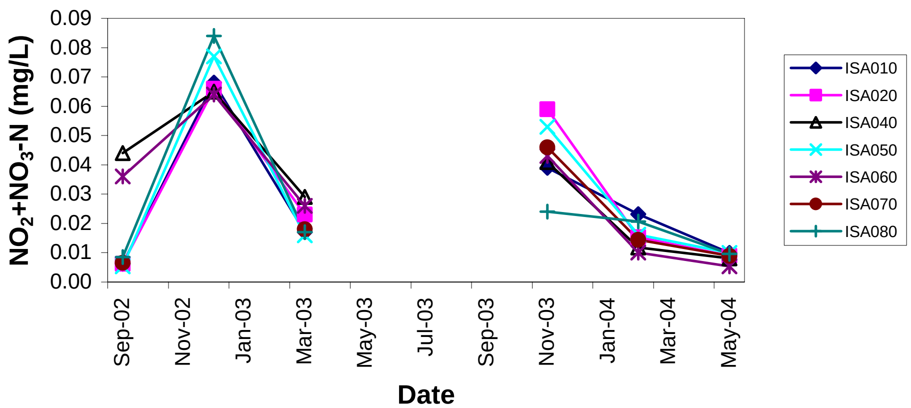
Lake Isabella Surface Water Total Kjeldahl Nitrogen (TKN) Values
September 2002 thru May 2004



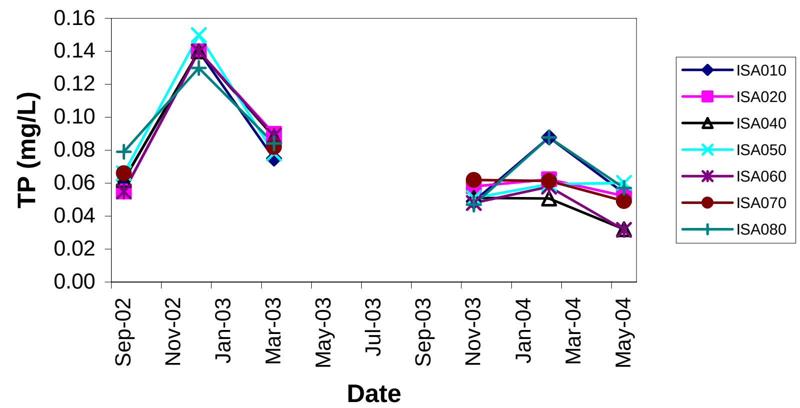
Lake Isabella Surface Water Ammonium as N (NH_4-N) Concentrations
September 2002 thru May 2004



Lake Isabella Surface Water Nitrite + Nitrate as N (NO_2+NO_3 – N) Concentrations
September 2002 thru May 2004

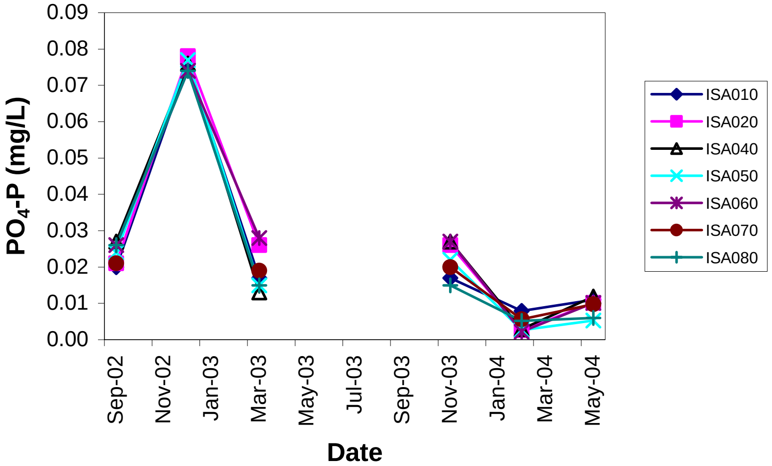


Lake Isabella Surface Water Total Phosphorous (TP) Concentrations
September 2002 thru May 2004



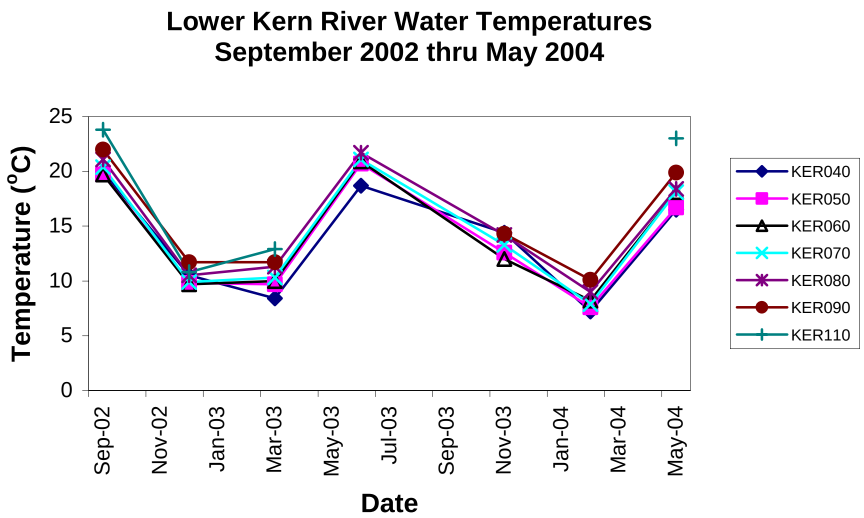
mg/L = milligrams/liter

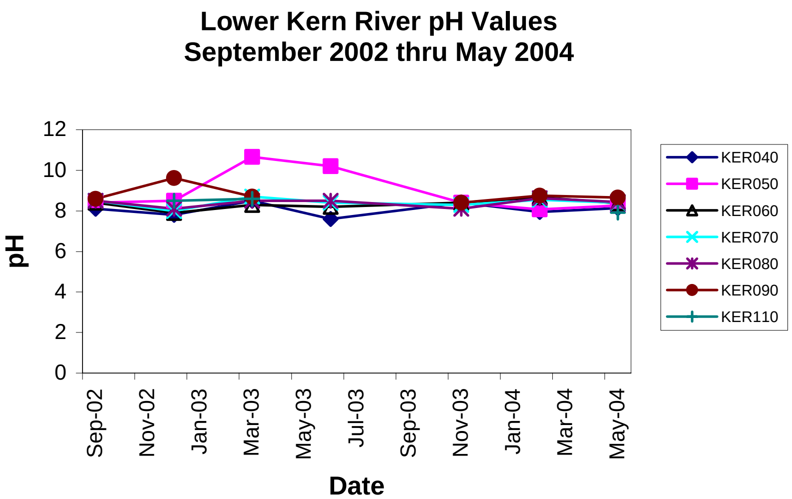
Lake Isabella Surface Water Soluble Reactive Phosphorous as P (PO_4-P) Concentrations September 2002 thru May 2004

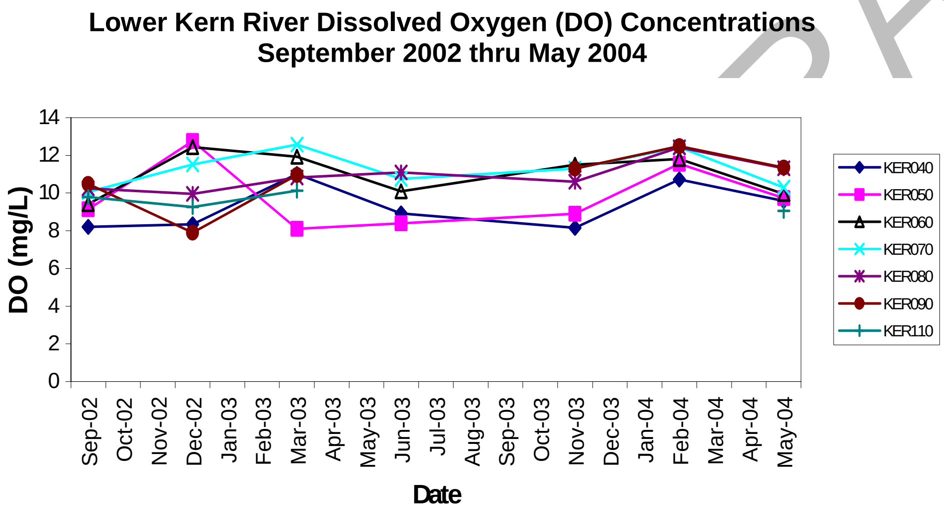


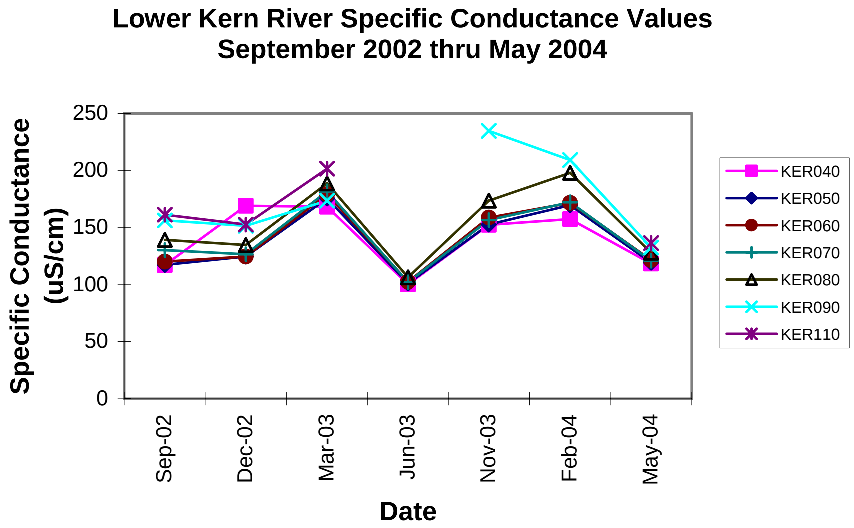
mg/L = milligrams/liter

ATTACHMENT E – Part III: LOWER KERN RIVER



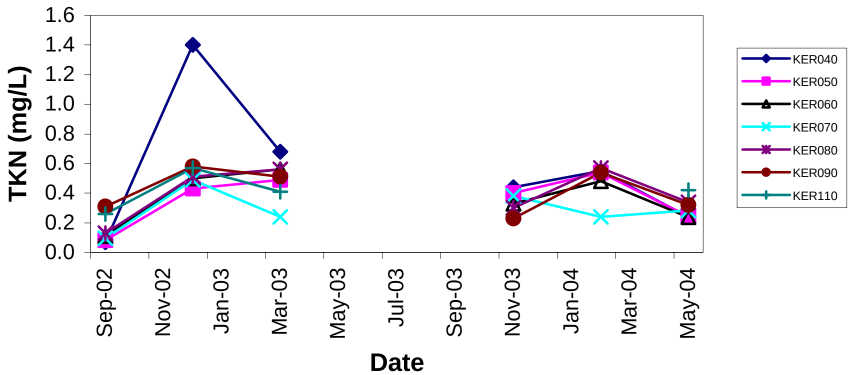




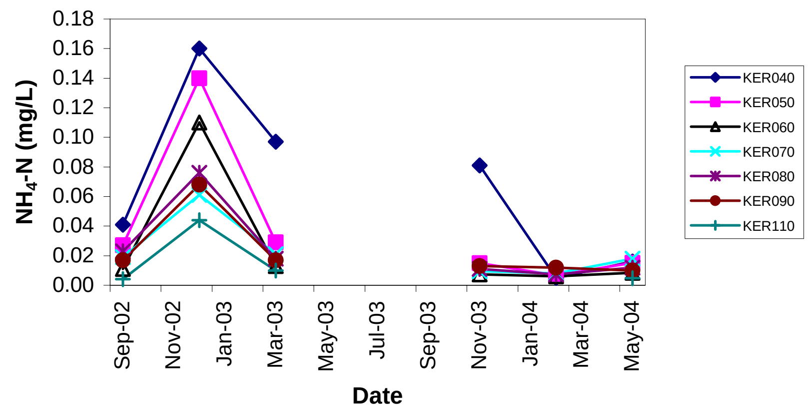


uS/cm = microSiemens/centimeter
mg/L = milligrams/liter

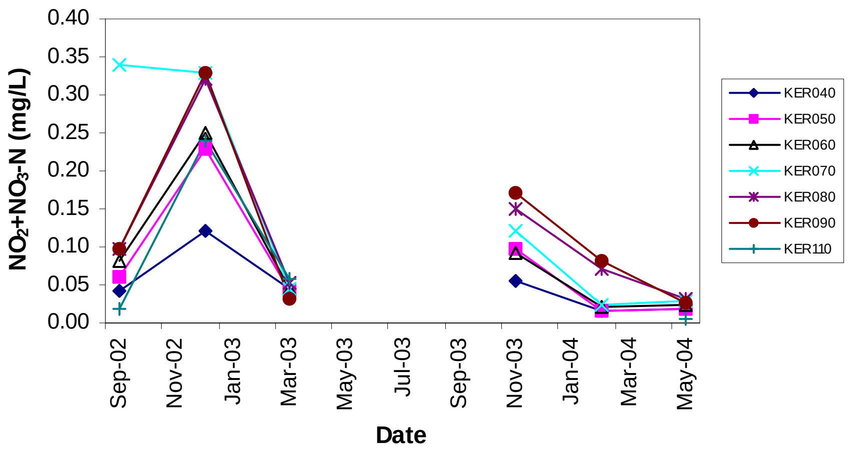
Lower Kern River Total Kjeldahl Nitrogen (TKN) Concentrations
September 2002 thru May 2004



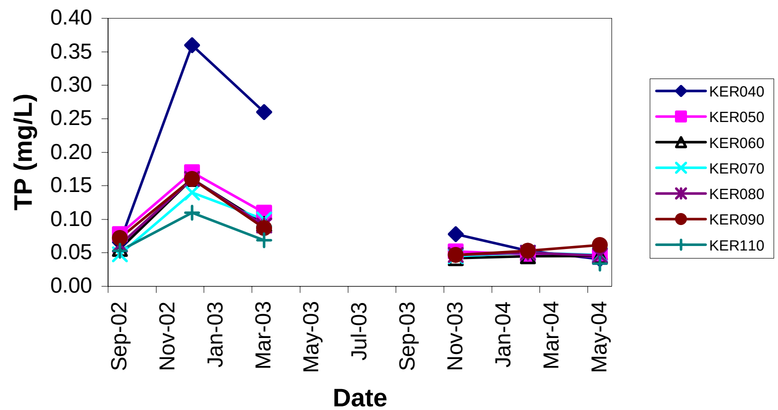
Lower Kern River Ammonium as N (NH_4-N) Concentrations
September 2002 thru May 2004



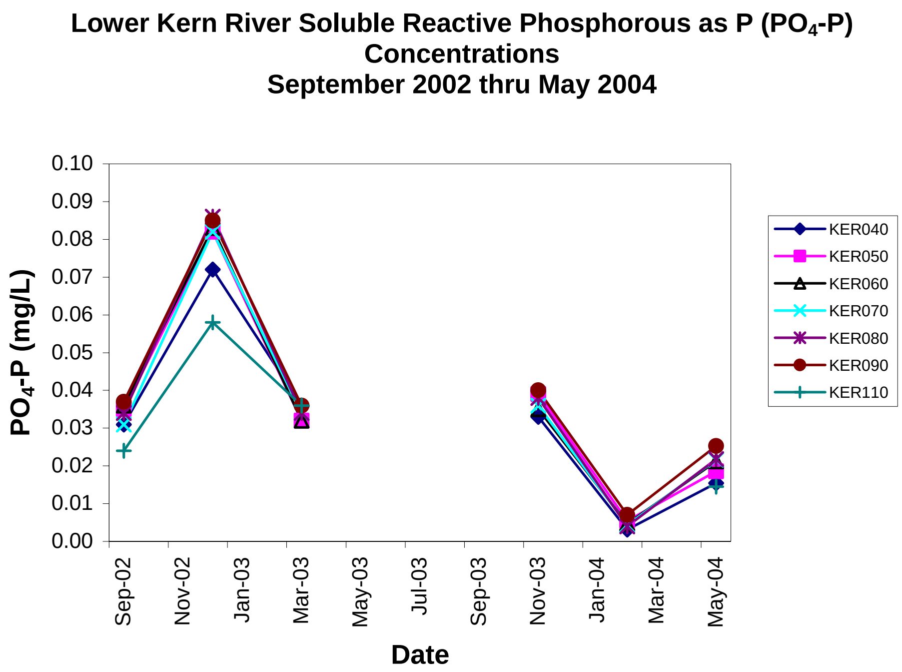
Lower Kern River Nitrite + Nitrate as N (NO_2+NO_3-N) Concentrations
September 2002 thru May 2004



Lower Kern River Total Phosphorous (TP) Concentrations
September 2002 thru May 2004



mg/L = milligrams/liter

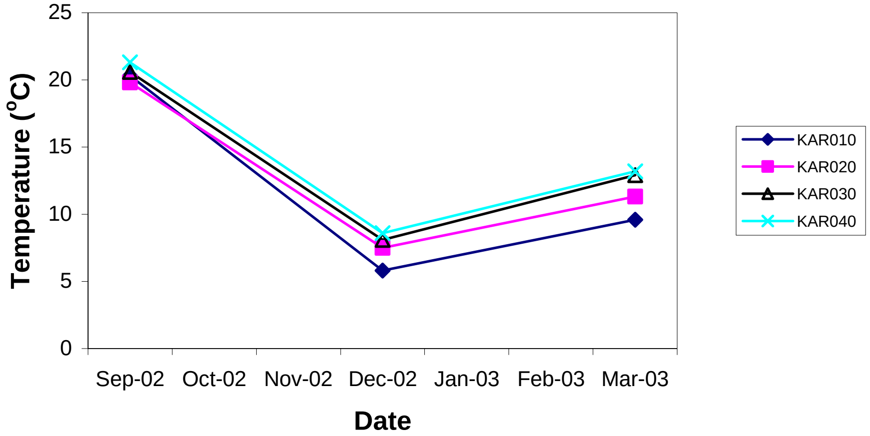


DRAFT

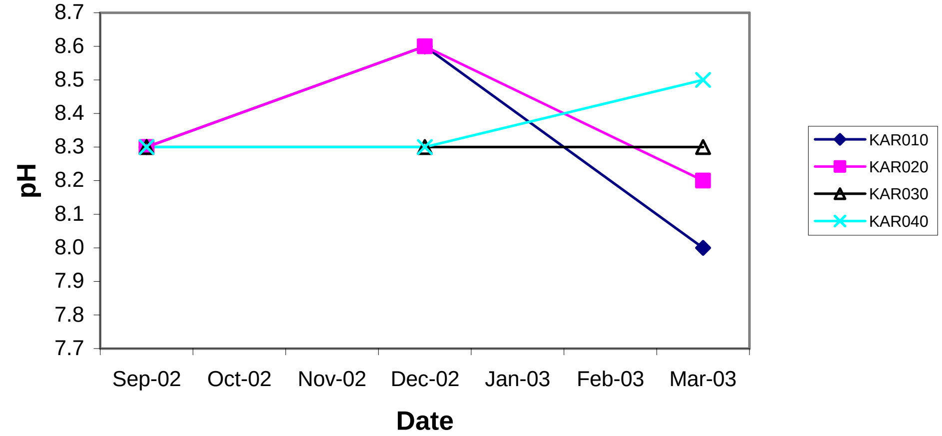
mg/L = milligrams/liter

ATTACHMENT F – Part I: UPPER KAWEAH RIVER

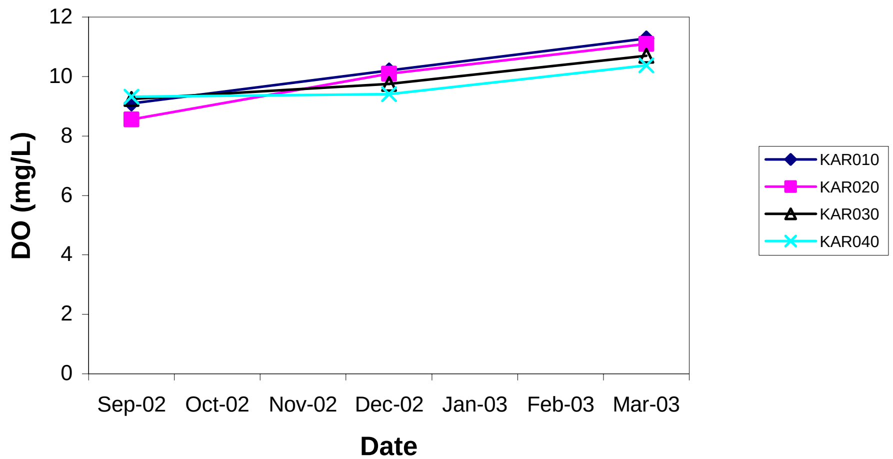
Upper Kaweah River Water Temperatures
September 2002 thru March 2003



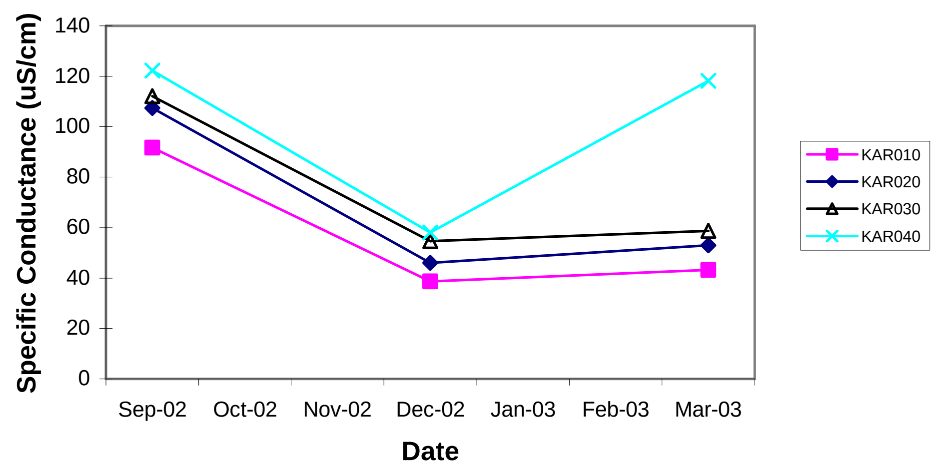
Upper Kaweah River pH Values
September 2002 thru March 2003



Upper Kaweah River Dissolved Oxygen (DO) Concentrations
September 2002 thru March 2003

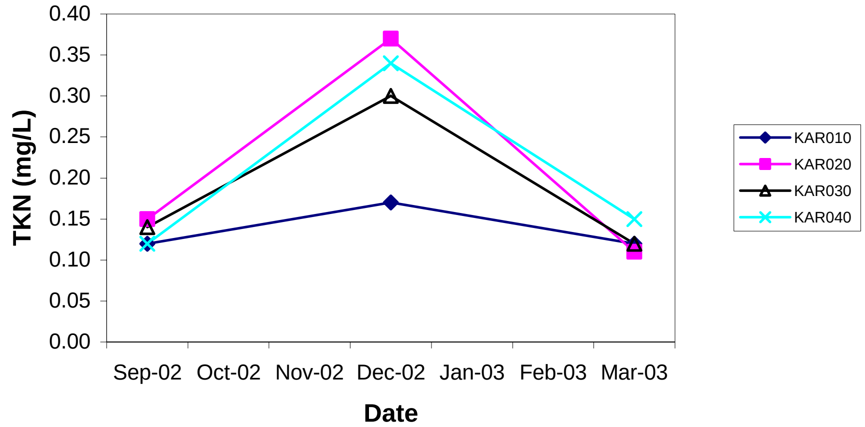


Upper Kaweah River Specific Conductance Values
September 2002 thru March 2003

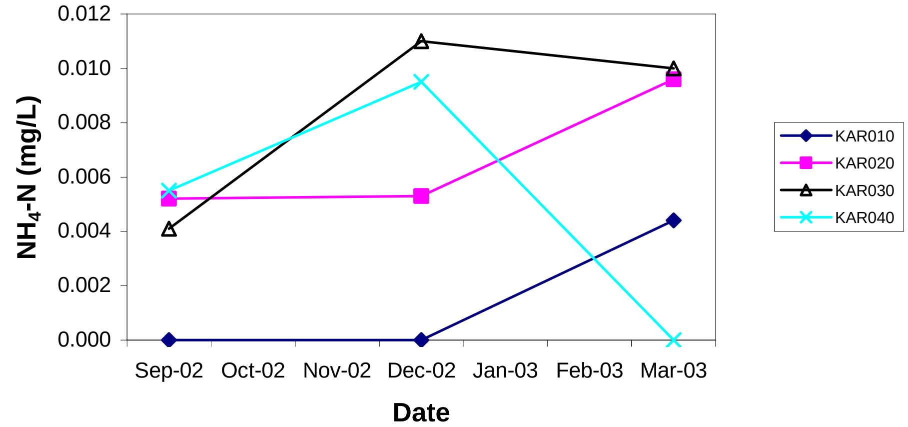


uS/cm = microSiemens/centimeter
mg/L = milligrams/liter

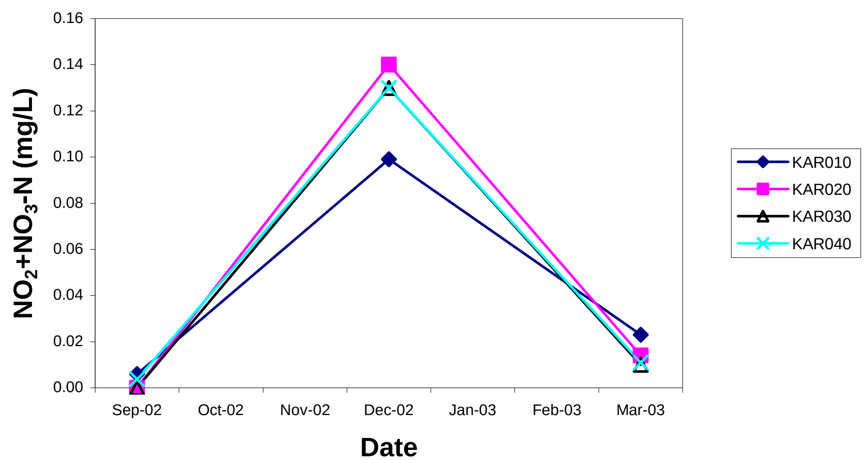
Upper Kaweah River Total Kjeldahl Nitrogen (TKN) Concentrations
September 2002 thru March 2003



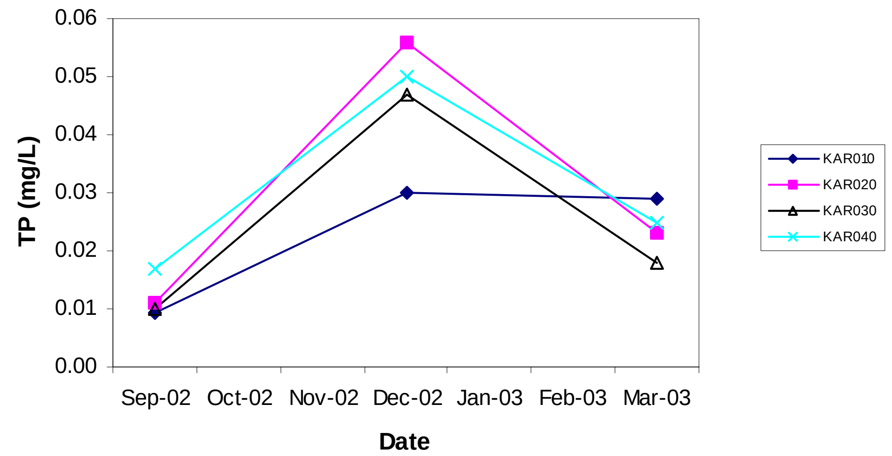
Upper Kaweah River Ammonium as N (NH_4-N) Concentrations
September 2002 thru March 2003



Upper Kaweah River Nitrite + Nitrate as N (NO_2+NO_3-N) Concentrations
September 2002 thru March 2003

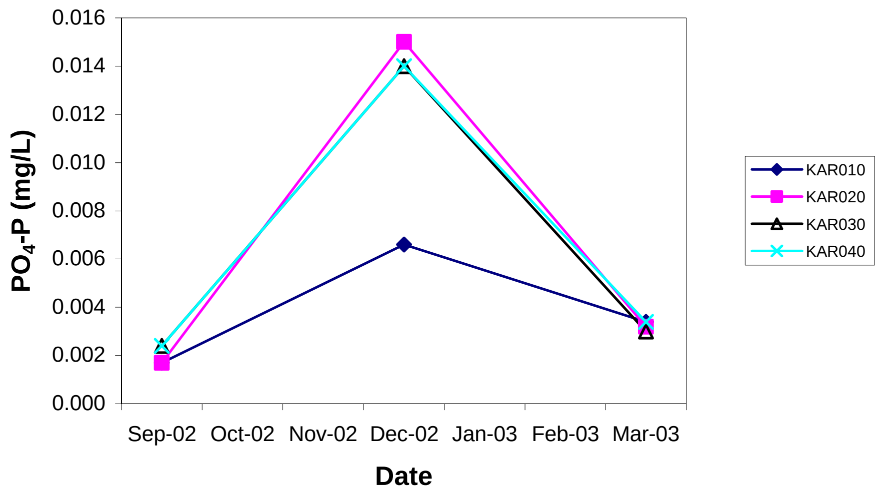


Upper Kaweah River Total Phosphorous (TP) Concentrations
September 2002 thru March 2003



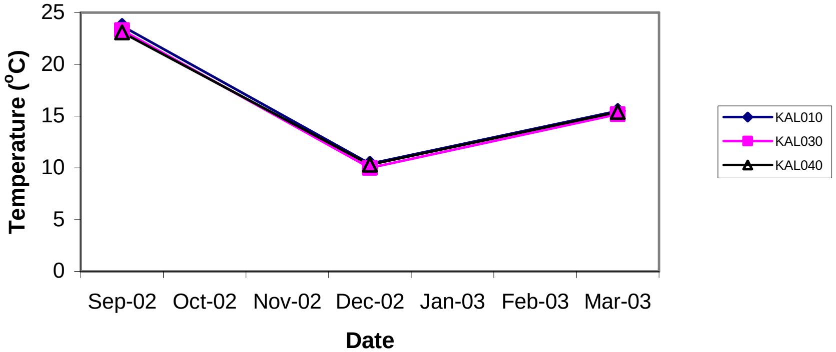
mg/L = milligrams/liter

Upper Kaweah River Soluble Reactive Phosphorous as P (PO_4-P) Concentrations September 2002 thru March 2003

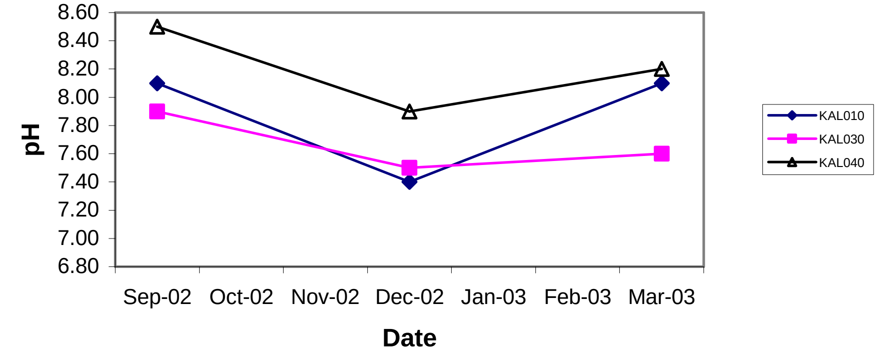


ATTACHMENT F – Part II: LAKE KAWEAH

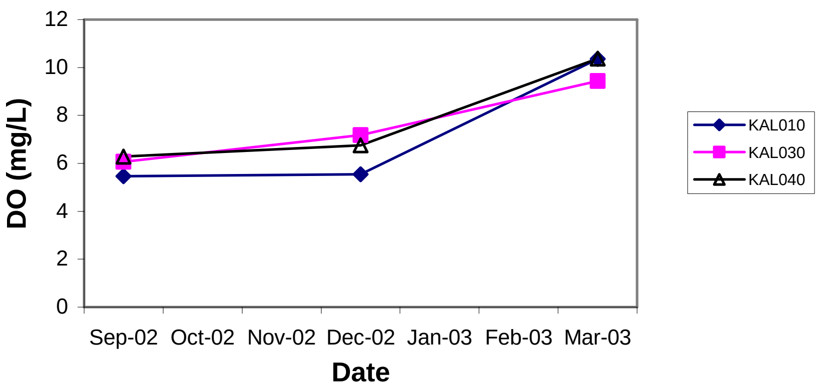
Lake Kaweah Surface Water Temperatures
September 2002 thru March 2003



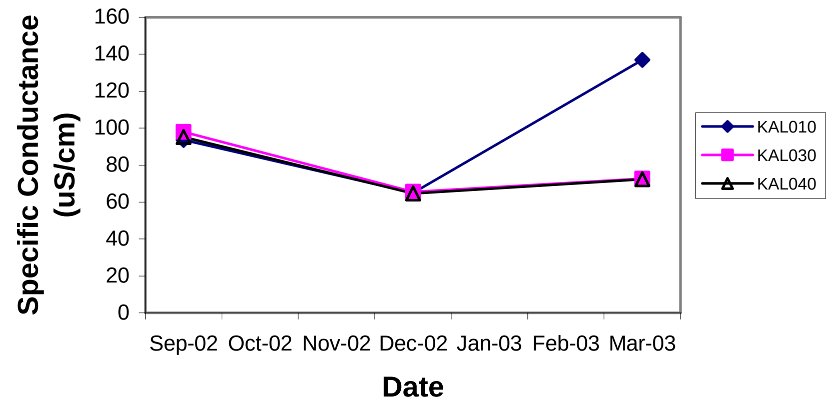
Lake Kaweah Surface Water pH Values
September 2002 thru March 2003



Lake Kaweah Surface Water Dissolved Oxygen (DO)
Concentrations
September 2002 thru March 2003

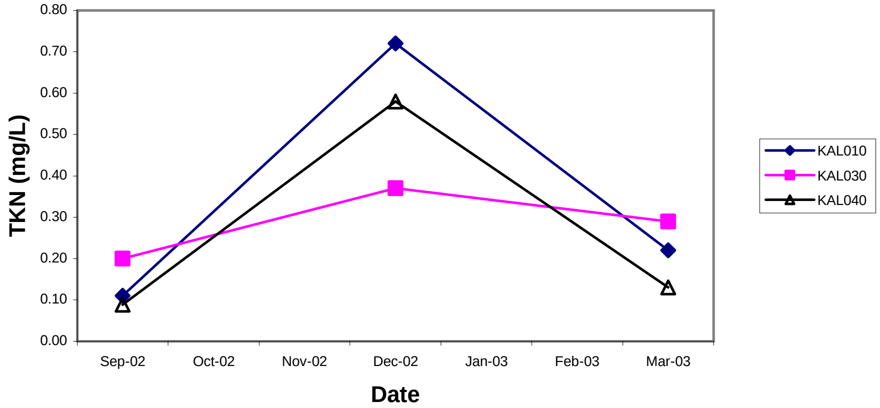


Lake Kaweah Surface Water Specific Conductance Values
September 2002 thru March 2003

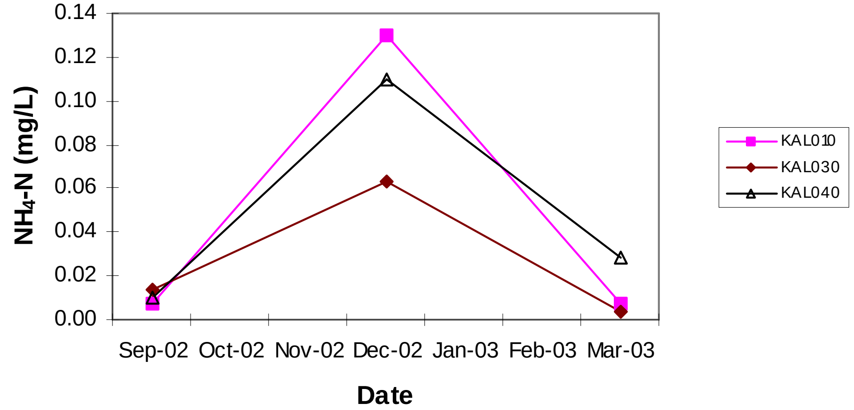


uS/cm = microSiemens/centimeter
mg/L = milligrams/liter

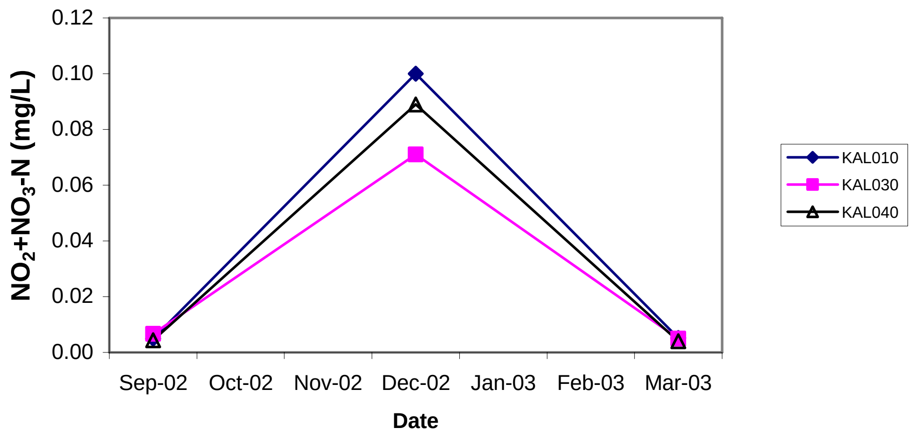
Lake Kaweah Surface Water Total Kjeldahl Nitrogen (TKN) Concentrations September 2002 thru March 2003



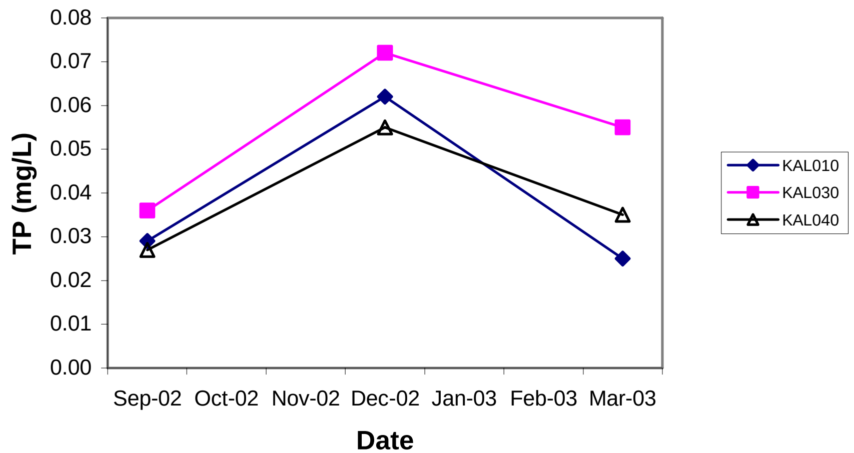
Lake Kaweah Surface Water Ammonium as N (NH_4-N) Concentrations September 2002 thru March 2003



Lake Kaweah Surface Water Nitrite + Nitrate as N (NO_2+NO_3-N) Concentrations September 2002 thru March 2003

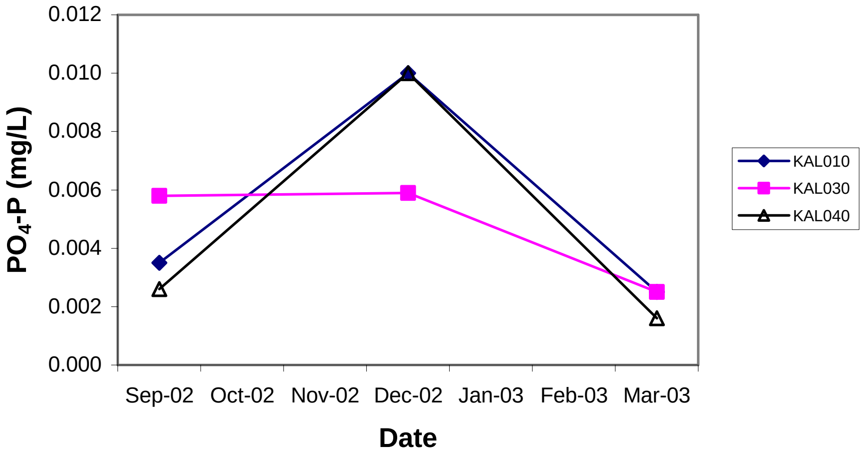


Lake Kaweah Surface Water Total Phosphorous (TP) Concentrations September 2002 thru March 2003



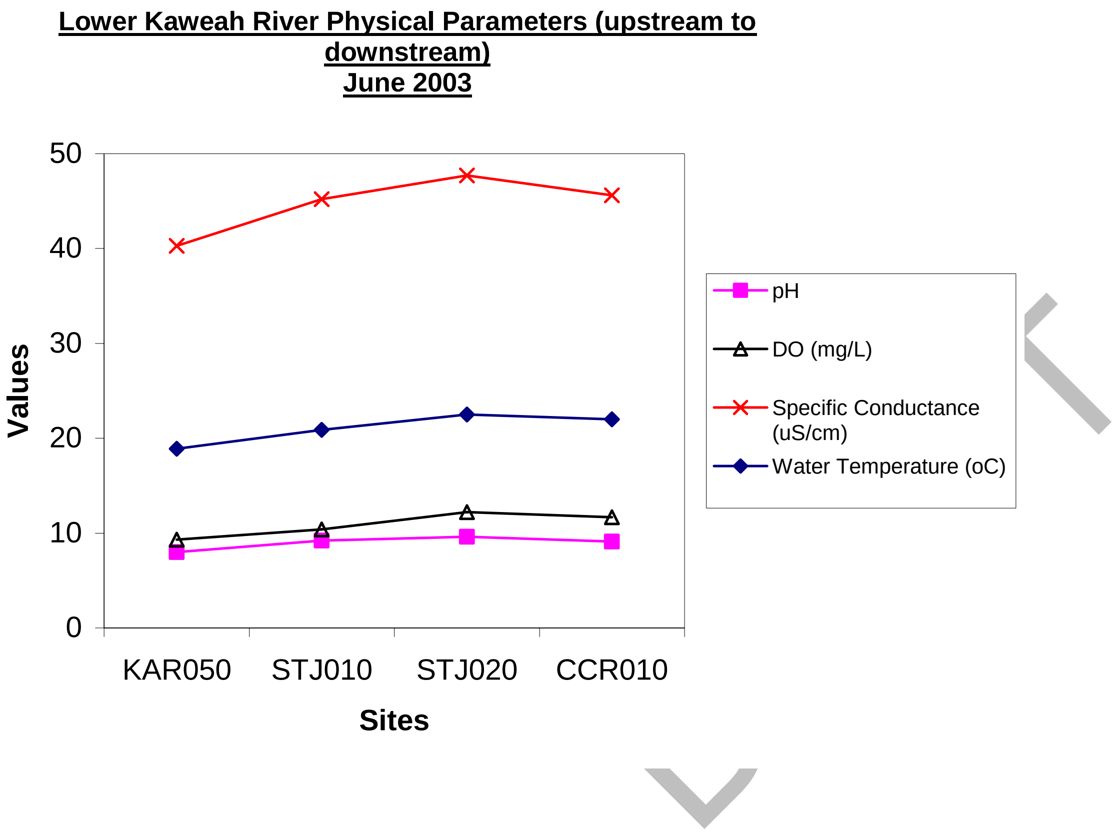
mg/L = milligrams/liter

Lake Kaweah Surface Water Soluble Reactive Phosphorous as P (PO_4-P) Concentrations
September 2002 thru March 2003

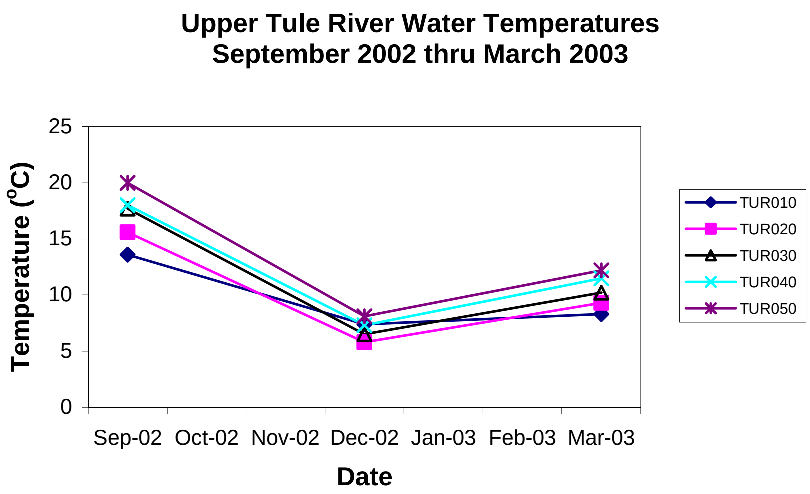


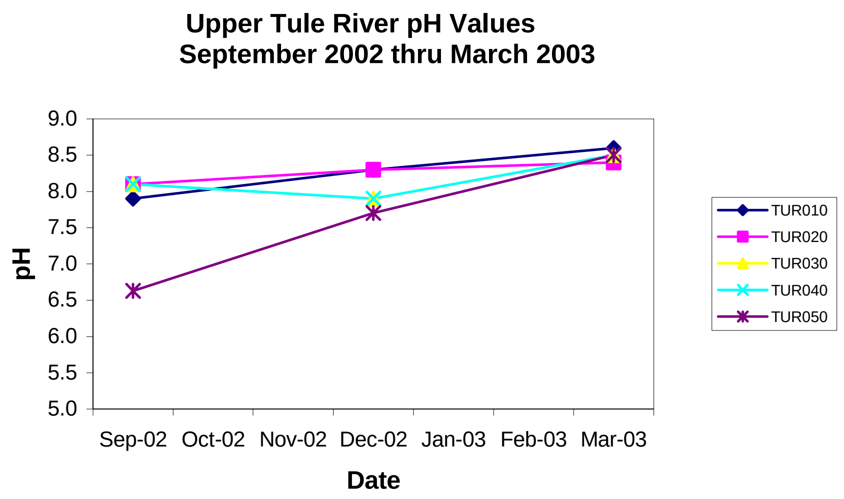
mg/L = milligrams/liter

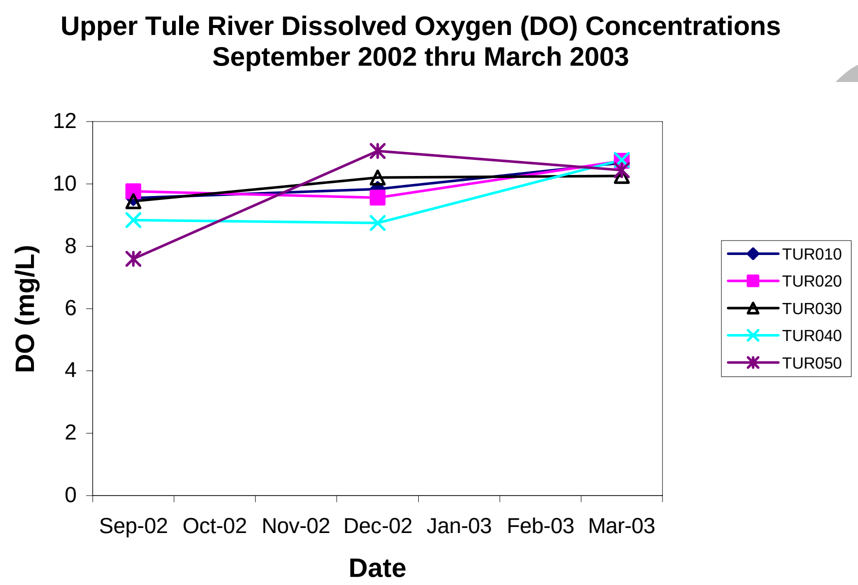
ATTACHMENT F – Part III: LOWER KAWEAH RIVER

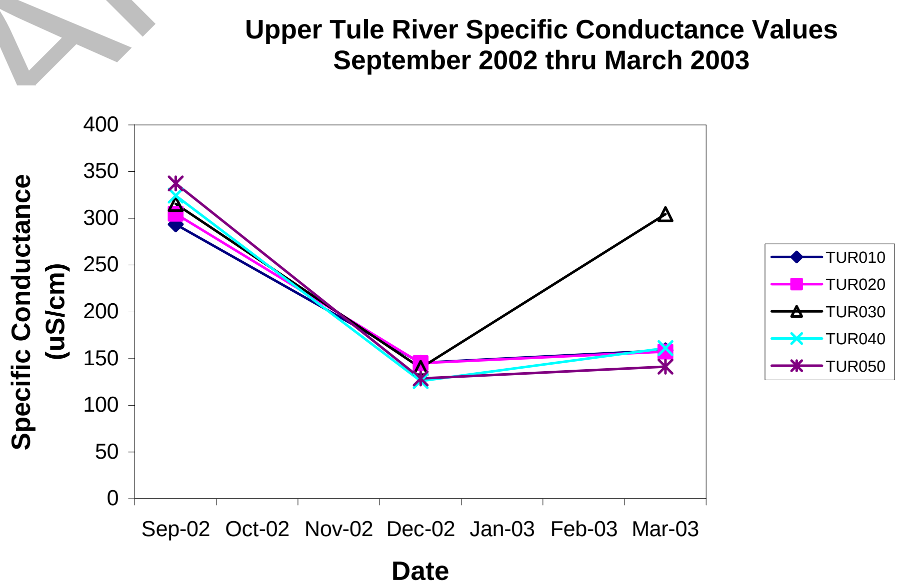


ATTACHMENT G – Part I: UPPER TULE RIVER



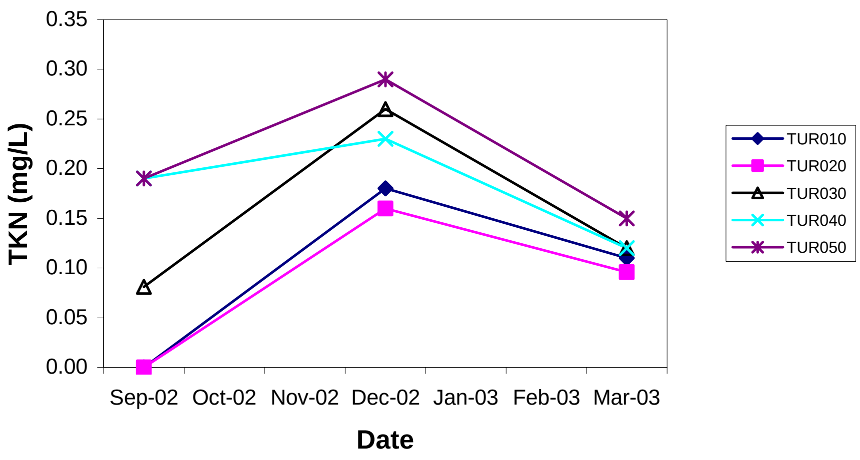




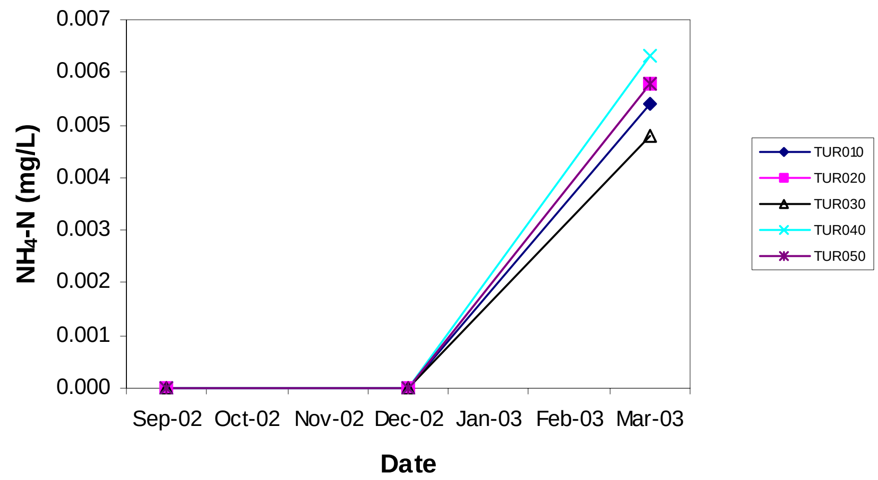


uS/cm = microSiemens/centimeter
mg/L = milligrams/liter

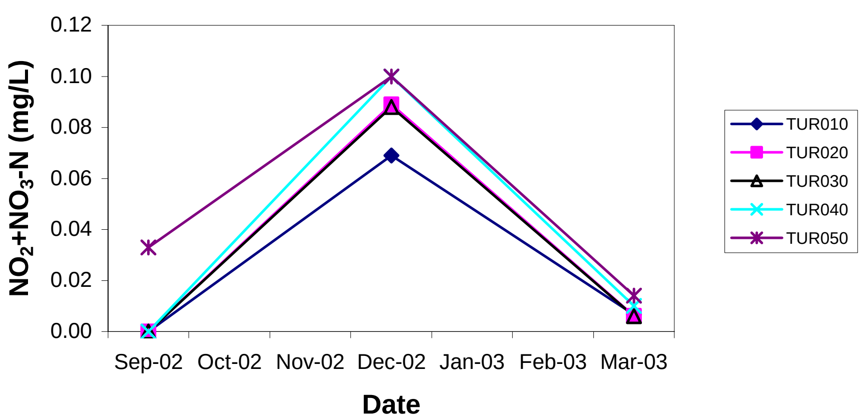
Upper Tule River Total Kjeldahl Nitrogen (TKN)
September 2002 thru March 2003



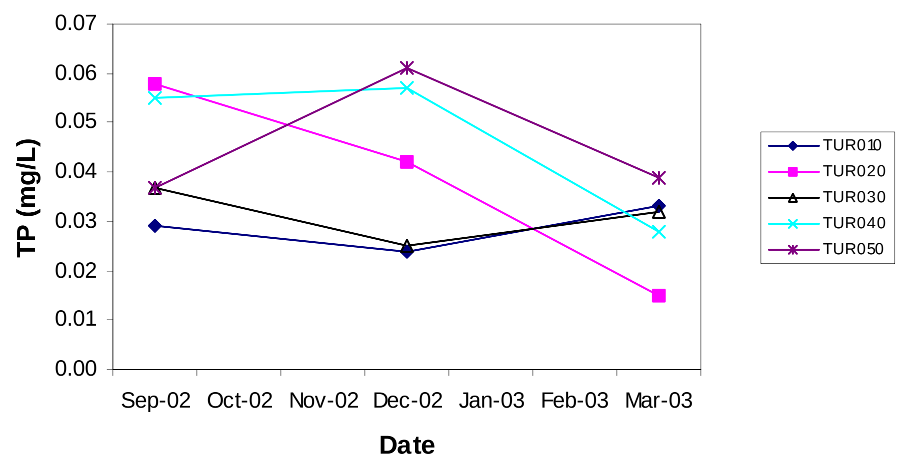
Upper Tule River Ammonium as N (NH_4-N) Concentrations
September 2002 thru March 2003



Upper Tule River Nitrite + Nitrate as N (NO_2+NO_3-N) Concentrations
September 2002 thru March 2003

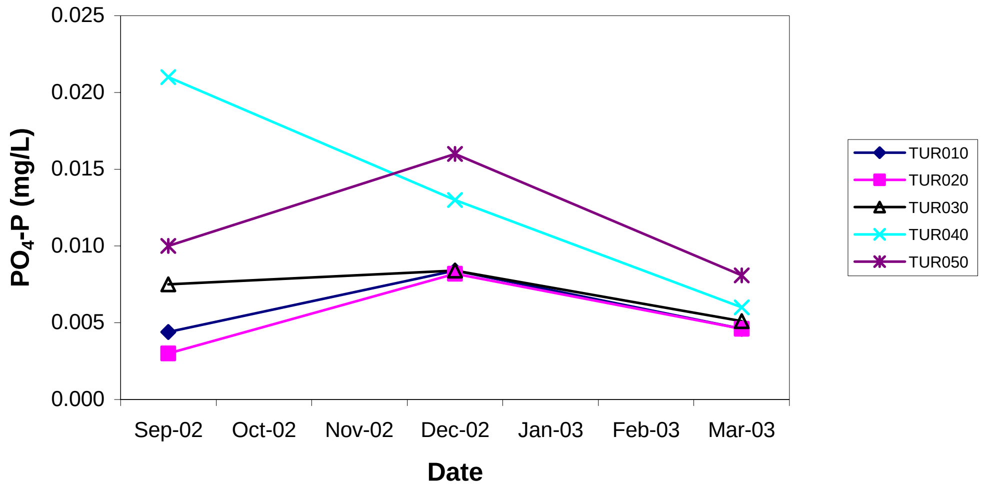


Upper Tule River Total Phosphorous (TP) Concentrations
September 2002 thru March 2003



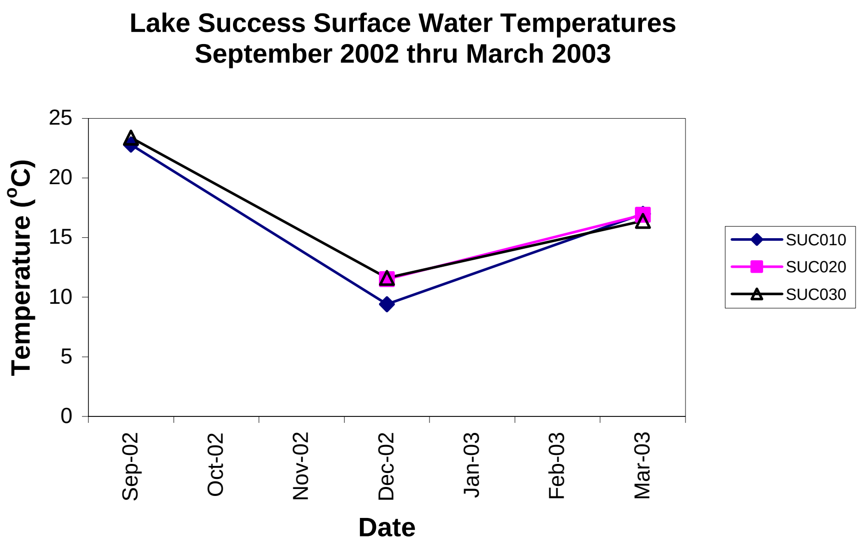
mg/L = milligrams/liter

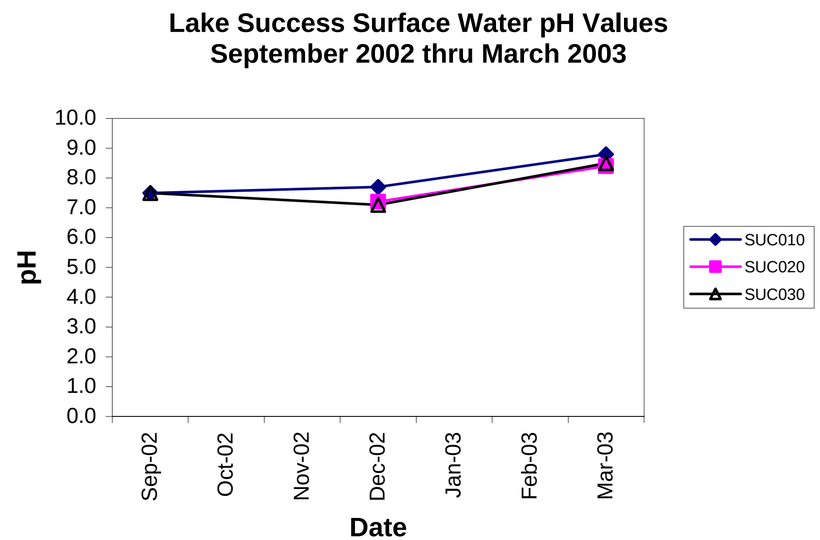
Upper Tule River Soluble Reactive Phosphorous as P (PO_4-P) Concentrations September 2002 thru March 2003

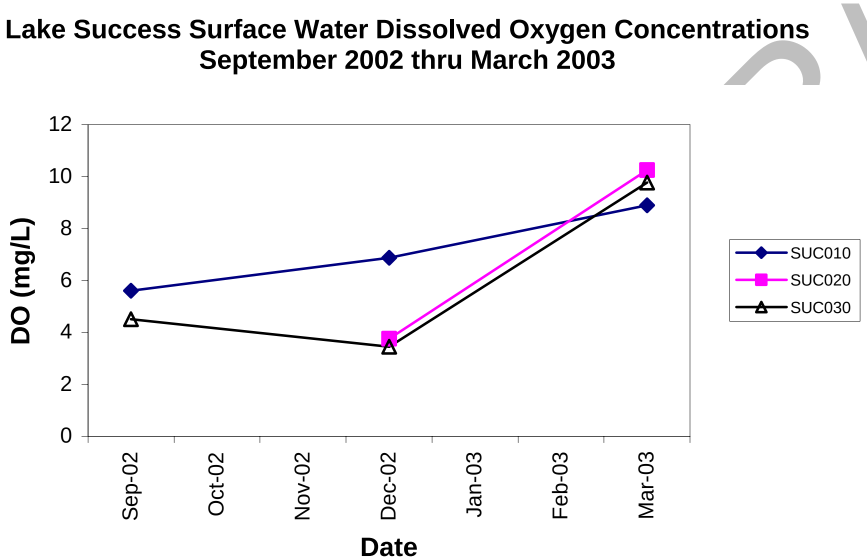


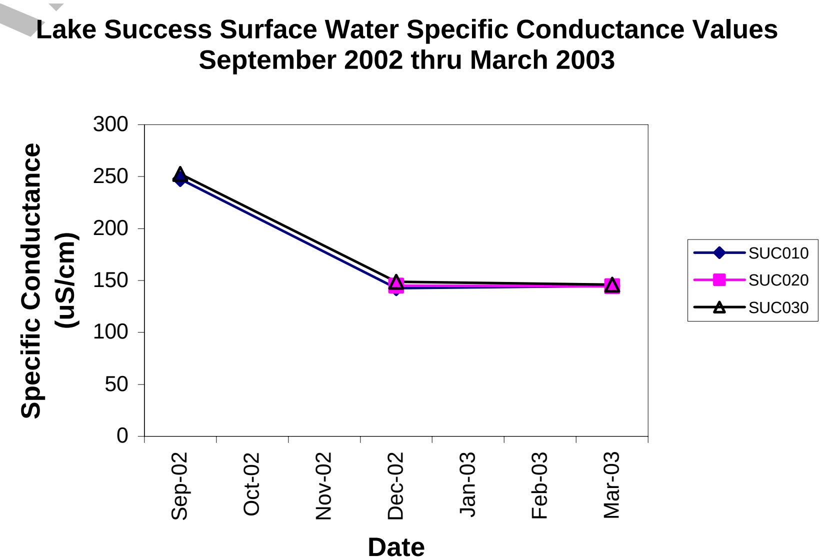
mg/L = milligrams/liter

ATTACHMENT G - Part II: LAKE SUCCESS

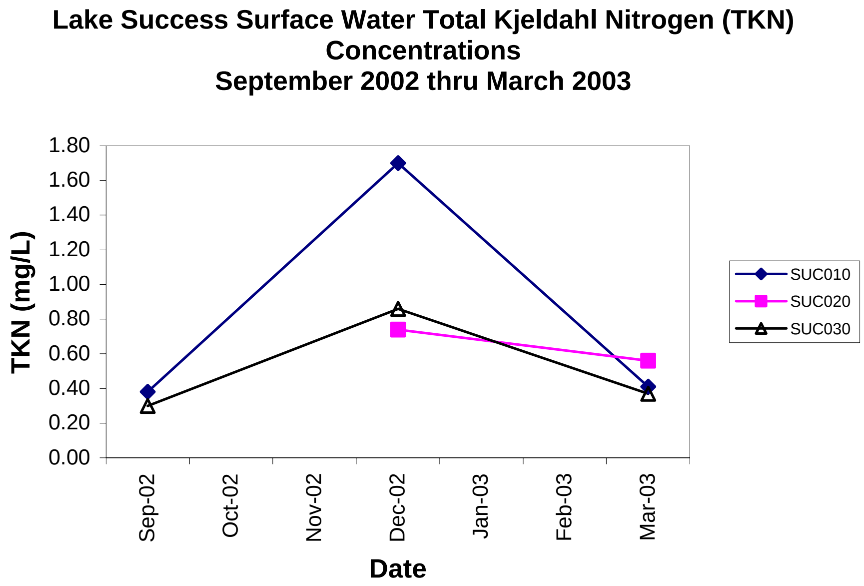


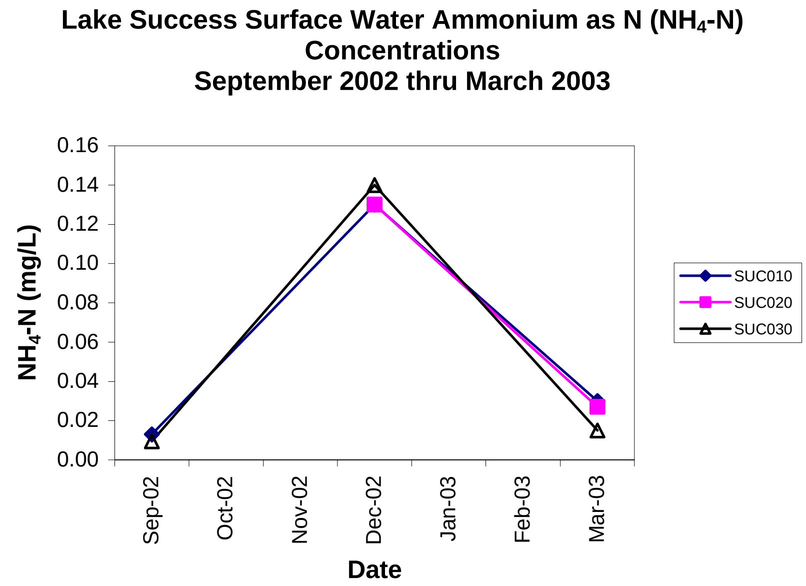




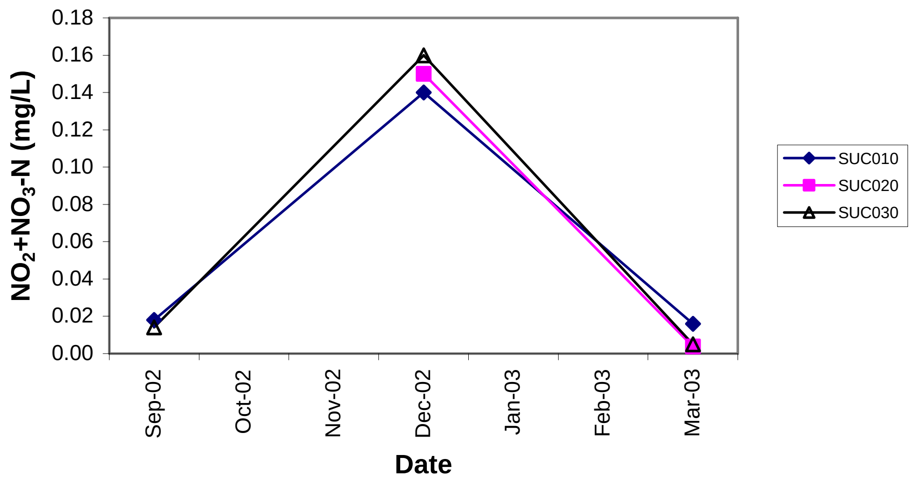


uS/cm = microSiemens/centimeter
mg/L = milligrams/liter

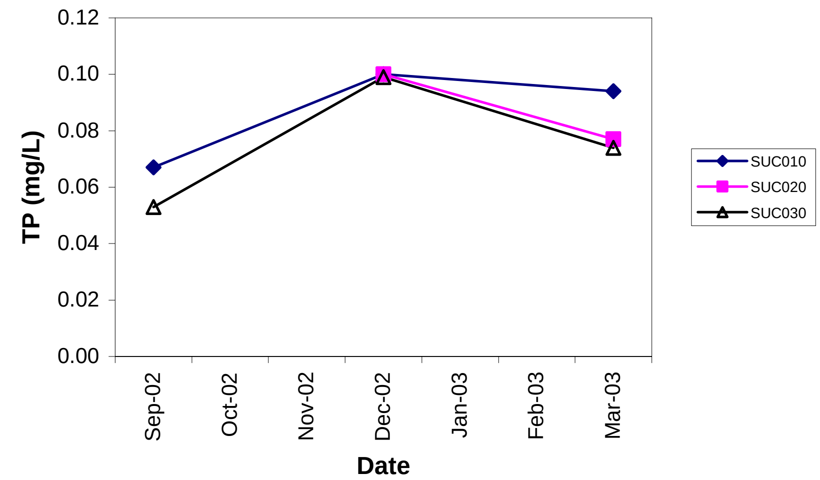

Lake Success Surface Water Total Kjeldahl Nitrogen (TKN) Concentrations
September 2002 thru March 2003
TKN (mg/L)
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
Sep-02
Oct-02
Nov-02
Dec-02
Jan-03
Feb-03
Mar-03
Date
SUC010
SUC020
SUC030


Lake Success Surface Water Ammonium as N (NH_4-N) Concentrations
September 2002 thru March 2003
NH_4-N (mg/L)
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Sep-02
Oct-02
Nov-02
Dec-02
Jan-03
Feb-03
Mar-03
Date
SUC010
SUC020
SUC030

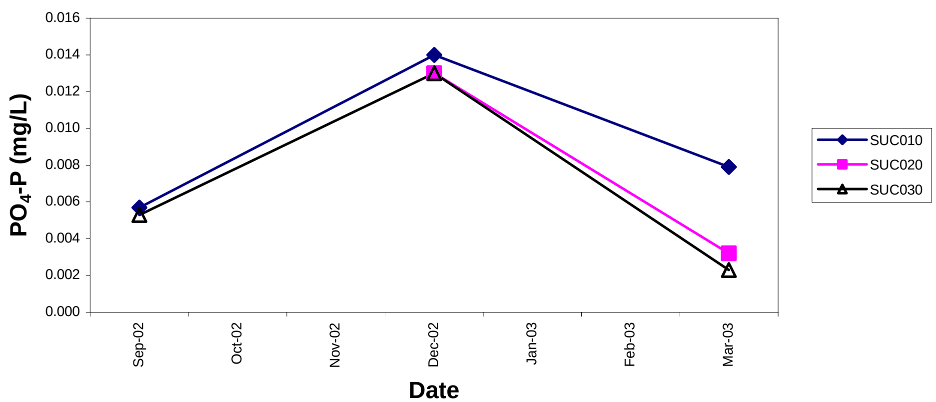
Lake Success Surface Water Nitrite + Nitrate as N (NO_2+NO_3-N) Concentrations
September 2002 thru March 2003



Lake Success Surface Water Total Phosphorous (TP) Concentrations
September 2002 thru March 2003



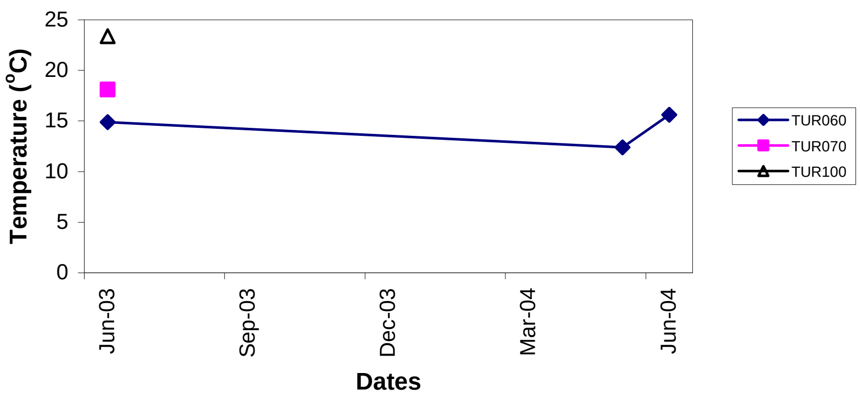
Lake Success Surface Water Soluble Reactive Phosphorous as P (PO_4-P) Concentrations
September 2002 thru March 2003



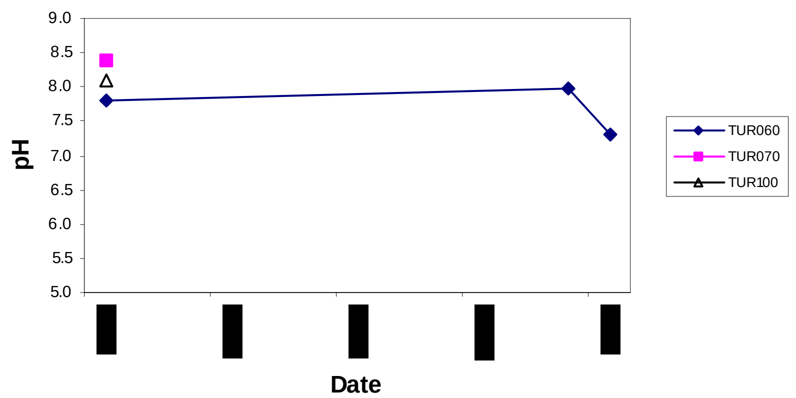
ATTACHMENT G – Part III: LOWER TULE RIVER

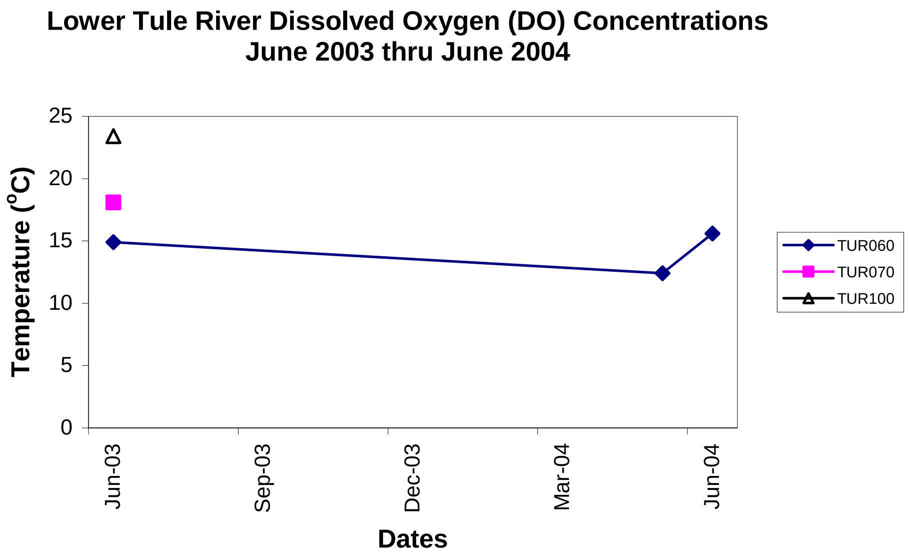
mg/L = milligrams/liter

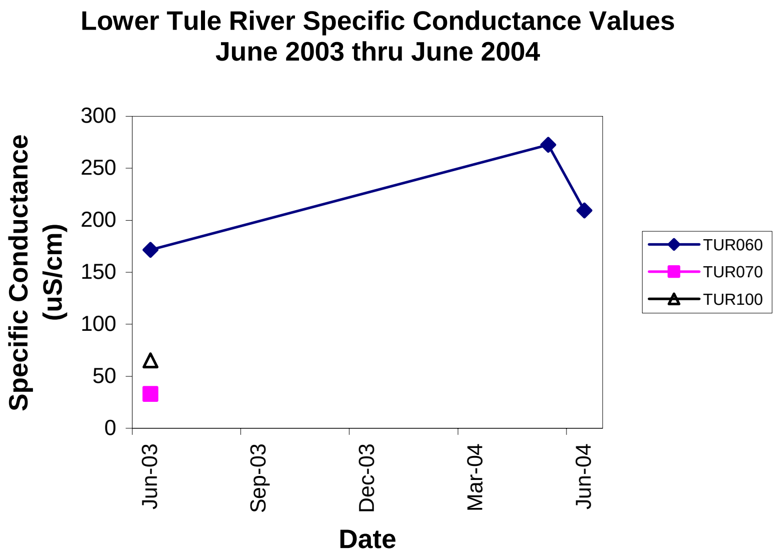
Lower River Water Temperatures
June 2003 thru June 2004



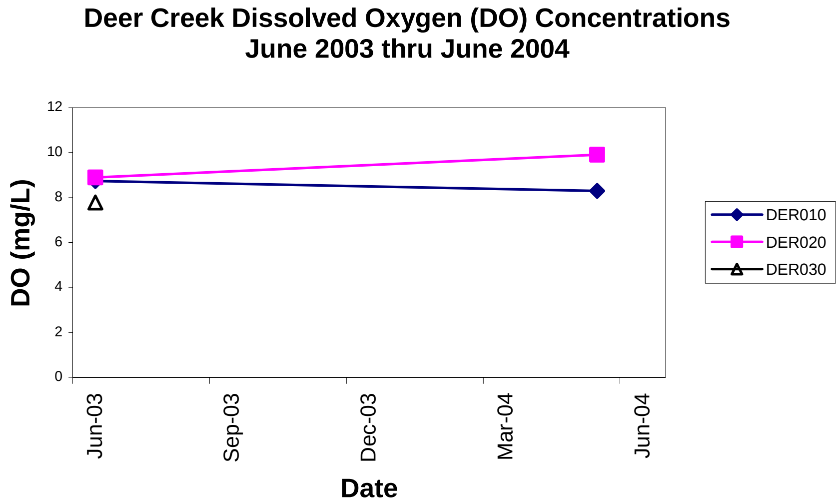
Lower Tule River pH Values
June 2003 thru June 2004

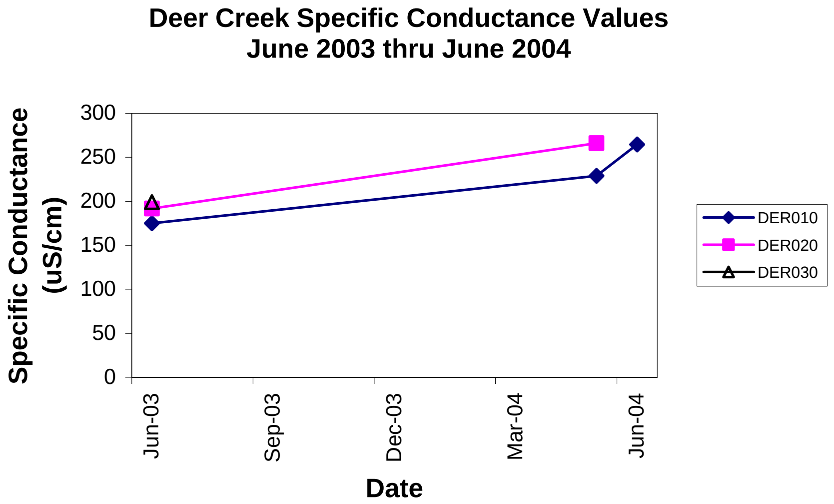



Lower Tule River Dissolved Oxygen (DO) Concentrations
June 2003 thru June 2004
Temperature (^{o}C)
25
20
15
10
5
0
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Dates
TUR060
TUR070
TUR100


Lower Tule River Specific Conductance Values
June 2003 thru June 2004
Specific Conductance (uS/cm)
300
250
200
150
100
50
0
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Date
TUR060
TUR070
TUR100

ATTACHMENT G – Part IV: DEER CREEK





uS/cm = microSiemens/centimeter
mg/L = milligrams/liter